

ORIGINAL

NEW APPLICATION



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BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

Arizona Corporation Commission

2007 OCT 12 P 3: 30

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E-04204A-07-0593

IN THE MATTER OF THE APPLICATION OF )

DOCKET NO. E-04204A-07-\_\_\_\_\_

UNS ELECTRIC, INC. FOR APPROVAL OF ITS )

RENEWABLE ENERGY STANDARD AND )

TARIFF IMPLEMENTATION PLAN. )

APPLICATION FOR APPROVAL  
OF UNS ELECTRIC, INC.'S  
RENEWABLE ENERGY  
STANDARD IMPLEMENTATION  
PLAN AND ASSOCIATED TARIFF

UNS Electric, Inc. ("UNS Electric" or the "Company"), through undersigned counsel, and pursuant to the Arizona Administrative Code ("A.A.C.") R14-2-1801, *et seq.* (the "Renewable Energy Standard and Tariff", or "REST"), hereby respectfully submits this Application for approval of its REST Implementation Plan. In support hereof, UNS Electric submits the following:

- (i) UNS Electric's REST Implementation Plan;
- (ii) UNS Electric's REST Tariff;
- (iii) UNS Electric's REST Adjustor Mechanism;
- (iv) UNS Electric's Uniform Credit Purchase Program ("UCPP");
- (v) UNS Electric's Customer Self-Directed Renewable Energy Option Tariff (the "UNS Electric Customer Self-Directed Tariff");
- (vi) UNS Electric's request for release from the provisions of A.A.C. R14-2-1618 (the "Environmental Portfolio Standard" or "EPS") and authority to apply unused Environmental Portfolio Surcharge funding to the REST programs; and,
- (vii) UNS Electric's request for consolidation of certain reporting requirements.

1 Each of these matters is integral to the successful implementation of the provisions of the  
2 REST in UNS Electric's service territory, and should be simultaneously approved and  
3 implemented. In support hereof, UNS Electric states as follows:

4 **I. INTRODUCTION.**

5 UNS Electric has long been a proponent of renewable energy and has been an active  
6 participant in the many proceedings that culminated in the adoption of the REST. The  
7 Company has provided the Commission and the public with volumes of data related to  
8 renewable energy, including its costs and benefits to society.

9 UNS Electric believes that, in order to meaningfully implement the provisions of the  
10 REST, its plan must realistically address customer choice, technology and cost. It would be  
11 imprudent for UNS Electric to propose (and the Commission to approve) a plan that ignores  
12 any of these important factors, establishes requirements that cannot be achieved or imposes an  
13 unnecessary economic burden on the Company or its customers.

14 The components of UNS Electric's overall plan for implementing the REST are: (i)  
15 UNS Electric's REST Implementation Plan; (ii) UNS Electric's REST Tariff; (iii) UNS  
16 Electric's REST Adjustor Mechanism; (iv) UNS Electric's UCPP; (v) UNS Electric's Customer  
17 Self-Directed Tariff; (vi) UNS Electric's request for release from the provisions of the EPS Rules,  
18 and the authority to apply unused EPS funding to the REST programs; and (vii) UNS Electric's  
19 request for consolidation of certain related reporting requirements. These plan components  
20 provide an appropriate balance of customer choice, technology and cost. UNS Electric  
21 respectfully requests that the Commission consider these components together, and approve and  
22 implement them simultaneously, so that the Company and its customers will be able to take  
23 advantage of the benefits of the provisions of the REST without being subject to unnecessary  
24 financial or technological risk.



1 **II. UNS ELECTRIC'S REST IMPLEMENTATION PLAN.**

2 Pursuant to A.A.C. R14-2-1813, UNS Electric is required to file a plan, for Commission  
3 review and approval, that describes how it intends to comply with the provisions of the REST for  
4 the next calendar year. Specifically, the implementation plan is to include the following items:

- 5 1. The Eligible Renewable Energy Resources technology that the Company is  
6 proposing to be added in each of the next five years, and a description of the kW's  
7 and kWh's expected to be obtained from each of those resources;
- 8 2. The estimated cost of those Eligible Renewable Energy Resources, including cost  
9 per kWh and total cost per year;
- 10 3. A description of how each Eligible Renewable Energy Resource will be obtained;
- 11 4. A proposal that evaluates whether the Company's existing rates allow for the  
12 ongoing recovery of the reasonable and prudent costs of complying with the REST ;  
13 and
- 14 5. A line item budget that allocates specific funding.

15 Through this Application, UNS Electric is presenting two (2) REST Implementation Plan  
16 options for Commission consideration. The first option reflects the implementation activities  
17 and related costs (including a tariff charge above the REST Sample Tariff charge) that UNS  
18 Electric believes are necessary to meet the renewable energy and related distributed energy  
19 percentages set forth in the REST. The second option reflects the implementation activities that  
20 UNS Electric believes can be funded by a tariff charge set at the REST Sample Tariff charge.

21 Option one, the "Full Compliance Opportunity Plan", proposes increased residential  
22 renewable energy system incentives that UNS Electric believes could further motivate customers  
23 to participate in programs. UNS Electric's REST Implementation Plan for the Full Compliance  
24 Opportunity Plan option is attached hereto as Exhibit 1, and is incorporated herein by this  
25 reference.<sup>1</sup> The Tariff, Adjustor Mechanism and UCPP associated with the Full Compliance  
26

27 <sup>1</sup> UNS Electric's REST Implementation Plan contains confidential information. Accordingly, the Company is filing a  
redacted, public version of UNS Electric's REST Implementation Plan. A non-redacted, or confidential, version of

1 Opportunity Plan option are attached as Exhibits 1(a), 1(b) and 1(c) respectively, and are  
2 incorporated herein by this reference. This option incorporates (i) the REST Sample Tariff rate;  
3 (ii) the REST Small Commercial cap; and, (iii) Residential and Large Commercial caps that are  
4 higher than those in the REST Sample Tariff. The Full Compliance Opportunity Plan option  
5 should provide sufficient funding to support a program that would result in UNS Electric's  
6 full compliance with the REST Rule in 2008, if purchased renewable energy sources  
7 perform as promised and if the distributed generation programs offered are fully subscribed  
8 by UNS Electric's customers.

9 Option two, the "Sample Tariff Funding Plan", relies upon the existing SunShare  
10 incentive rates for residential photovoltaic installations in 2008 to reduce residential distributed  
11 generation requirements from 5.00% of the total renewable energy to 3.45% for the same year.  
12 UNS Electric's REST Implementation Plan for the Sample Tariff Funding Plan option is  
13 attached hereto as Exhibit 2, and is incorporated herein by this reference.<sup>1</sup> The Tariff, Adjustor  
14 Mechanism and UCPP associated with the Sample Tariff Funding Plan option are attached as  
15 Exhibits 2(a), 2(b) and 2(c) respectively, and are incorporated herein by this reference. Option two  
16 uses the REST Sample Tariff to fund the Implementation Plan and develops a program based  
17 upon that amount of funding. However, this option will not likely result in UNS Electric  
18 being in REST compliance in 2008.

19 These alternative Implementation Plans describe the renewable energy resources capacity  
20 that may be added during the next five years, the annual energy expected to be produced from  
21 these resources, estimated customer funding and tariff amounts required to support acquisition  
22 of those resources in 2008, and a 2008 program budget. The REST annual renewable energy  
23 requirement begins at 1.75% of total retail sales in 2008 and requires a minimum of 10% of the  
24  
25

26 UNS Electric's REST Implementation Plan will be provided to Commission Staff and other parties to this  
27 proceeding upon execution of a confidentiality agreement.

1 renewable energy to come from distributed energy sources, of which at least 50% must be from  
2 residential customer sources.

3         UNS Electric's REST Implementation Plan reflects the Company's best estimate, based  
4 upon information presently available, of renewable technologies that may be available over the  
5 next five years. The Implementation Plan lists the annual renewable energy and associated  
6 installed capacity by expected renewable energy source to be provided within the UNS Electric  
7 service territory for each of the next five years. It further describes the concepts of renewable  
8 energy procurement and the factors associated with the timely development of renewable energy  
9 sources to meet the REST requirements. Finally, the UNS Electric REST Implementation Plan  
10 discusses the expected budgeted expenses of the renewable energy programs.

11         REST funding is intended to cover the cost of utility-scale renewable generation in  
12 excess of the market cost of conventional resource alternatives, incentive payments for  
13 distributed energy resources, marketing expenses and program implementation, and  
14 administration costs. The above-market costs for renewable generation are based upon UNS  
15 Electric's current perceptions of that market. The costs for distributed generation incentives and the  
16 program budget are based upon incentives developed as part of the Commission Staff's working  
17 group and UNS Electric's best estimations of market uptake for the various technologies available  
18 to its customers.

19         UNS Electric currently estimates the cost of the Full Compliance Opportunity Plan,  
20 to comply with the REST, to be \$4.3 million in 2008 - increasing to \$10.4 million by 2012 -  
21 with a five year total of \$35.4 million, as reflected in the Full Compliance Opportunity  
22 Implementation Plan. The Sample Tariff Funding Plan is estimated to cost \$2.4 million in  
23 2008, \$9.5 million in 2012, with a five year total of \$29.2 million, but is not likely to provide  
24 sufficient funding required to meet the residential distributed generation portion of the REST  
25 requirements. Annual increases in the program budget are driven mainly by the annually  
26 increasing energy targets.

27

1 At this time, UNS Electric is requesting approval of the REST Implementation Plan for  
2 the Full Compliance Opportunity Plan option, and its associated REST Tariff adjuster funding  
3 of \$4.4 million for the full year of 2008. Should the Commission alternatively approve the  
4 Sample Tariff Funding Plan option, the associated REST Tariff would collect about \$2.1 million  
5 for the full year of 2008.

6 **III. UNS ELECTRIC'S REST TARIFF.**

7 Pursuant to A.A.C. R14-2-1808(A), the Company is required to submit for Commission  
8 approval UNS Electric's REST Tariff, modeled upon the Sample Tariff contained in the REST  
9 rules. UNS Electric's two REST Tariffs, one Tariff corresponding to the Full Compliance  
10 Opportunity Plan option and the other Tariff corresponding to the Sample Tariff Funding Plan  
11 Option, are attached hereto as Exhibits 1(a) and 2(a), respectively. UNS Electric's REST Tariffs  
12 are designed to recover all the particular plan expenses of (i) renewable energy purchases; (ii)  
13 administration, education and outreach related to REST programs; (iii) tracking first-year REST  
14 programs; and, (iv) UCPP expenses.

15 UNS Electric's REST Tariff for the Full Compliance Opportunity Plan incorporates (i)  
16 the REST Sample Tariff rate; (ii) the REST Small Commercial cap; and, (iii) Residential and  
17 Large Commercial caps that are higher than those in the REST Sample Tariff. UNS Electric  
18 estimates that this Tariff will generate approximately \$4.4 million in revenue during 2008.

19 UNS Electric's REST Tariff for the Sample Tariff Funding Plan incorporates the REST  
20 Sample Tariff rate and caps. UNS Electric estimates that this tariff will generate approximately  
21 \$2.1 million in revenues during 2008. The Company respectfully requests that the Commission  
22 approve the version of the UNS Electric REST Tariff that corresponds to the option that is  
23 authorized, and that both the Plan and the Tariff become effective simultaneously.

24 **IV. UNS ELECTRIC'S REST ADJUSTOR MECHANISM.**

25 An important element of UNS Electric's REST Implementation Plan is an adjustor  
26 mechanism that will provide timely recovery for the expenses incurred related to REST  
27 programs. Accordingly, UNS Electric is requesting that the Commission approve in this

1 proceeding UNS Electric's REST Adjustor Mechanism, as contemplated by A.A.C R14-2-  
2 1808(D).

3       UNS Electric is proposing one Adjustor Mechanism for the Full Compliance  
4 Opportunity Plan, attached as Exhibit 1(b), and another Adjustor Mechanism for the Sample  
5 Tariff Funding Plan, attached as Exhibit 2(b). UNS Electric's REST Adjustor Mechanism will  
6 operate to true-up previous year REST program expenses and revenues, and apply any resulting  
7 shortage or surplus to subsequent year REST funding requirements. For example, if in 2009 it is  
8 reported that 2008 actual REST expenses were \$4.8 million and actual REST revenues were \$4.4  
9 million, the resulting revenue shortage of \$0.4 million would be applied to the REST Tariff  
10 requirements in 2010. UNS Electric's REST Adjustor Mechanism is designed to provide timely  
11 revenue recovery for (i) expenses incurred by UNS Electric for all REST programs; and (ii) the  
12 REST Performance Incentive. The REST Performance Incentive Mechanism calculation  
13 description is provided in Exhibit 3, attached hereto and incorporated by this reference herein.

14       UNS Electric's REST Adjustor Mechanism, and its methodology, are set forth in Exhibit 4,  
15 incorporated herein by this reference. The concept of a REST Adjustor Mechanism was raised by  
16 Commission Staff during the UNS Electric rate case proceeding, Docket No. E-04204A-06-0783  
17 (the "UNS Electric Rate Case").

18 **V. UNS ELECTRIC'S UNIFORM CREDIT PURCHASE PROGRAM.**

19       Pursuant to A.A.C. R14-2-1810(B), the Company is filing UNS Electric's UCPP  
20 which incorporates virtually all of the recommendations made by the Commission Staff's  
21 informal UCPP working group. UNS Electric's UCPP addresses: (i) the consumer  
22 participation process; (ii) budgets; (iii) incentive levels; (iv) eligible technologies; (v) system  
23 requirements; (vi) installation requirements; and, (vii) fund allocation methods.

24       UNS Electric is presenting two (2) UCPP proposals for Commission consideration.  
25 UCPP proposal one corresponds to the Full Compliance Opportunity Plan option and is attached  
26 hereto as Exhibit 1(c), incorporated herein by this reference. Proposal one increases residential  
27 renewable energy system incentives in connection with the Full Compliance Opportunity Plan.

1 UCPP proposal two corresponds to the Sample Tariff Funding Plan option and is attached hereto  
2 as Exhibit 2(c), incorporated herein by this reference. This UCPP proposes to use the existing  
3 SunShare incentive rates for residential photovoltaic installations in connection with the Sample  
4 Tariff Funding Plan. The Company believes that either of the two UCPP proposals will  
5 encourage greater participation in the development of customer owned renewable energy  
6 production systems. The draft customer distributed energy incentive application forms and  
7 renewable energy credit purchase agreements for administration of the UCPP are attached hereto  
8 as Exhibit 5, and are incorporated herein by reference. It is important to note that in its UCPP  
9 proposal, UNS Electric proposes a change to the language in A.A.C. R14-2-1803.B to assure  
10 efficiency of thermally driven cooling systems, as presented during the REST comment period.

11 **VI. UNS ELECTRIC'S CUSTOMER SELF-DIRECTED TARIFF.**

12 In accordance with A.A.C. R14-2-1809(A), the Company is required to file a tariff  
13 pursuant to which an "Eligible Customer" may apply to UNS Electric for funds to install  
14 distributed renewable energy resources. UNS Electric has created the Customer Self-Directed  
15 Renewable Energy Option Tariff (REST-TS2) (hereinafter referred to as the "UNS Electric  
16 Customer Self-Directed Tariff"). The UNS Electric Customer Self-Directed Tariff is attached  
17 hereto as Exhibit 6, and is incorporated herein by this reference. The UNS Electric Customer  
18 Self-Directed Tariff applies to either plan option and provides Eligible Customers with  
19 information needed to maximize the benefits of UNS Electric REST Tariff funds. The  
20 Company believes that the UNS Electric Customer Self-Directed Tariff will provide a  
21 meaningful option for those customers who are interested in installing distributed energy  
22 resources and seeking financial assistance from UNS Electric.

23 **VII. FORMAL RELEASE FROM EPS REQUIREMENT.**

24 The REST will supersede the EPS. However, there is no provision in the REST or in the  
25 Commission order that either ends the Company's EPS obligations or addresses the disposition of  
26 Environmental Portfolio Surcharge funding, approved in Decision No. 63353 (February 8, 2001).  
27 Therefore, UNS Electric requests that in this proceeding, upon approval of UNS Electric's REST

1 Implementation Plan and related items, the Commission formally release UNS Electric from  
2 further compliance with the EPS. UNS Electric further requests that the Commission authorize the  
3 Company to apply all unused Environmental Portfolio Surcharge funding to REST program  
4 expenses.

5 **VIII. REQUEST FOR CONSOLIDATION.**

6 UNS Electric requests that the annual reporting requirements set forth for the  
7 GreenWatts SunShare Hardware Buydown Program in Decision No. 67178 (August 10, 2004)  
8 be consolidated with the reporting requirements set forth in A.A.C. R14-2-1812.

9 **IX. CONCLUSION.**

10 This filing presents the Commission with a comprehensive package of actions that, if  
11 approved, will provide a realistic approach for meeting the aggressive goals and requirements  
12 of the REST. UNS Electric believes that the components of this filing are necessary to  
13 balance the elements of customer choice, technology and cost. For all of the reasons set forth  
14 herein, UNS Electric respectfully requests that the Commission issue its order approving:

- 15 (i) UNS Electric's REST Implementation Plan;
- 16 (ii) UNS Electric's REST Tariff;
- 17 (iii) UNS Electric's REST Adjustor Mechanism;
- 18 (iv) UNS Electric's UCPP;
- 19 (v) UNS Electric's Customer Self-Directed Tariff;
- 20 (vi) UNS Electric's release from the provisions of A.A.C. R14-2-1618 et seq. (the EPS)  
21 and authority to apply unused Environmental Portfolio Surcharge funding to the  
22 REST programs; and,
- 23 (vii) UNS Electric's request for the consolidation of certain reporting requirements.

24 WHEREFORE, for all the forgoing reasons, UNS Electric respectfully requests that the  
25 Commission issue its order approving UNS Electric's REST Implementation Plan, with the Full  
26 Compliance Opportunity Plan option, and the associated REST Tariff, because UNS Electric  
27 believes that the Plan and the Tariff are in the public interest and in compliance with the REST.

1 In the alternative, UNS Electric requests that the Commission approve UNS Electric's REST  
2 Implementation Plan with the Sample Tariff Funding Plan option.

3 RESPECTFULLY SUBMITTED this 12<sup>th</sup> day of October 2007.

4 UNS ELECTRIC, INC.

5  
6 By: 

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# Exhibit 1

## Redacted Version

**UNS Electric, Inc.**  
**Renewable Energy Standard & Tariff**

**Implementation Plan**

**(Full Compliance Opportunity Plan)**

**2008**

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## **ATTACHMENTS**

- Attachment 1** Five-Year Renewable Energy and Capacity Forecast with Cost Estimates
- Attachment 2** Market Cost of Comparable Conventional Generation Conceptual Definition
- Attachment 3** New Mexico Wind Energy Above-MCCCCG Cost Evaluation (**REDACTED**)
- Attachment 4** Arizona Wind Energy Above-MCCCCG Cost Evaluation (**REDACTED**)
- Attachment 5** Tucson Area Landfill Gas Energy Above-MCCCCG Cost Evaluation (**REDACTED**)
- Attachment 6** Tucson Area Solar Energy Above-MCCCCG Cost Evaluation (**REDACTED**)
- Attachment 7** UNS Electric Environmental Portfolio Standard Programs Report for Year-End 2006
- Attachment 8** UNS Electric UCPP Description
- Attachment 9** UNS Electric REST Line Item Budget

## **I. INTRODUCTION**

UNS Electric, Inc.'s ("UNS Electric" or "Company") Implementation Plan offers higher incentive values for residential systems and should provide sufficient funding to support a program that would result in UNS Electric's full compliance with the REST Rule in 2008. This assumes, however, that purchased renewable energy sources are available in sufficient timely quantities and perform as promised, and the distributed generation programs offered are fully subscribed by UNS Electric's customers.

UNS Electric currently estimates that, in order to fully comply with the REST, its costs will be \$4.3 million in 2008 and increasing to \$10.4 million by 2012, with a five-year total of \$35.4 million. REST funding is intended to cover the cost of utility-scale renewable generation in excess of the market cost of conventional resource alternatives, incentive payments for distributed energy resources, marketing expenses, and program implementation and administration costs. The above-market costs for renewable generation are based upon UNS Electric's current understanding of that market as derived from bids received as a result of an RFP for renewable energy as well as extensive discussion with renewable energy vendors and installers. The costs for distributed generation incentives and the program budget are based upon incentives developed as part of the Commission Staff's working group and UNS Electric's best estimations of market uptake for the various technologies available to its customers. Annual increases in the program budget are driven mainly by the annually increasing energy targets.

## **II. PROGRAM BACKGROUND**

### **A. Renewable Energy Requirements**

This Renewable Energy Standard and Tariff Implementation Plan has been created in response to the requirements of Arizona Administrative Code ("A.A.C.") R14-2-1801 through R14-2-1815, formally known as the Renewable Energy Standard and Tariff ("REST") rules. The Plan's main purpose is to present the renewable energy purchase and development plan as UNS Electric's Implementation Plan portfolio and cost recovery mechanisms for the REST. Pursuant to the A.A.C. R14-2-1801, et seq., the Company is hereby filing its REST compliance programs. Several parties, including the Commission Staff, stated a preference to consider the ultimate cost recovery of such a program through an adjustor mechanism in the context of the greater rate case proceeding. Therefore, consideration is being given regarding the adjustor mechanism in that separate rate case, Docket No. E-04204A-06-0783 (the "UNS Electric Rate Case"), as well as part of this REST program filing. The REST requires that affected utilities satisfy an annual renewable energy requirement by providing a percentage of their retail electric energy sales from renewable resources. The required annual renewable energy percentage for the first year of implementation, 2008, begins at 1.75% and increases to 3.50% in 2012.

Renewable resources under this rule include "renewable generation" projects, which are constructed solely to export their energy production to the utility, and renewable distributed generation ("DG"), which is a renewable resource application acquired, installed, and operated by customers on their premises that is used to displace the customer's energy consumption. As part of the REST, the energy generated or displaced by the DG is applied towards the

percentage of the utility's distributed renewable energy requirement. To determine compliance with the REST, the metric used to track energy in kilowatt hours ("kWh") derived from renewable resources is the Renewable Energy Credit ("REC"), with one kWh equaling one REC.

Meeting the REST requirements presents all of the affected Arizona utilities, including UNS Electric, with a number of uncertainties going forward. Given the needs of our neighboring states to meet their renewable energy mandates there could be intense competition for renewable energy sources over the next several years. This competition will add to the other challenges UNS Electric faces in meeting the REST annual energy requirements. These include the timely completion and energy production from contracted renewable energy sources, availability of qualified contractors to install renewable DG facilities, the number of customers who will opt to participate in renewable DG projects, and the further development of technology to make renewable energy sufficiently affordable and reliable to be of primary interest to electric utility customers. Risks also include issues such as: the availability, level and consistency of federal, state and local incentives; the availability of renewable energy projects executed by financially and technically sound developers; the availability of adequate transmission resources to deliver new renewable energy resources to UNS Electric load; the availability of renewable energy projects matching UNS Electric's anticipated cost profiles; the timing of new resource availability; and the ability of DG technologies and technology providers to serve the needs of customers. UNS Electric acknowledged the risks identified above and attempted to account for them in its Implementation Plan. The timely delivery of energy from renewable resources is critical to UNS Electric's compliance with the energy targets; development of these types of projects typically requires between two to five years. Recent experience across the nation indicates renewable generation projects suffer from high levels of project failure, broadly summarized as the inability to meet contract energy delivery dates. These failures and delays can be attributed to a wide range of issues, but are generally attributed to the immature nature of the renewable resource markets. Published experience with renewable energy projects in California suggests that a minimum overall contract failure rate of 20-30% should generally be expected for large solicitations. UNS Electric has attempted to develop an implementation plan that assumes a slightly lower level of project failure rate to that observed in California. As a way to buffer against these risks, UNS Electric's experience with both renewable energy projects and with conventional energy technologies suggests that careful project screening can reduce, but not eliminate, some of the risk associated with project failures. However, as UNS Electric does not currently have a source of sustained funding for above market renewable energy purchases, UNS Electric can not yet enter into a contract for a specific renewable energy source until the REST Implementation Plan and REST Tariff are approved. Consequently, the Implementation Plan is general in nature and not specific with regard to the mix of resources to be used to meet the REST requirements in 2008.

Utilities such as UNS Electric that are affected by the REST rules are required by A.A.C. R14-2-1813(A) to file an Implementation Plan each year for review and approval by the Arizona Corporation Commission ("Commission"). The Plan must describe the procurement of renewable energy resources for the next five calendar years that will meet the requirements of the REST. This description must identify the considered technologies, the expected schedule for the resource incorporation on a year-by-year basis, and a description of the kilowatts ("kW")

capacity and kWh of energy that are expected to be added to the UNS Electric generation portfolio by the incorporation of those renewable energy resources. This is UNS Electric's proposed initial Implementation Plan.

## **B. Development of Renewables in UNS Electric's Service Territory**

### **1. Resource Planning**

UNS Electric has historically recognized that long-term resource planning is an essential element in determining both supply- and demand-side elements of energy production and delivery when making decisions regarding construction of new generation and transmission assets. UNS Electric has studied numerous cost-effective alternative energy sources to meet the growing energy needs of its customers. UNS Electric's long-term resource planning process is an integral part of the renewable energy planning and goal-setting process. The forecast of annual kWh of energy and kW of capacity from renewable energy resources by technology to meet the REST goals is listed in Attachment 1.

UNS Electric initially considers self-build renewable energy options in the cost evaluation portion of the planning process, but does not include them as a criterion in determining the need for renewable generation options. Purchased renewable power allows for greater flexibility in use of scarce financial resources in developing renewable generation resources, which are typically priced above the Market Cost of Comparable Conventional Generation ("MCCCG"). Purchase of renewable energy allows UNS Electric to more effectively use its resources in developing renewable energy for its customers through partnering with renewable energy developers. It is thus an essential element in the Company's generation portfolio. However, cost-effective self-build renewable energy options will be pursued as an alternate to purchased renewable energy if necessary. At this time in this Implementation Plan, UNS Electric plans to purchase all of its non-DG renewable energy needed beyond that energy from its existing fleet of wind and solar generation systems and a landfill gas-to-energy facility. UNS Electric may, as a last resort if purchased renewable energy supplies are insufficient to meet REST requirements, purchase Renewable Energy Credits from its bank created during the EPS program to meet REST requirements.

UNS Electric uses an Independent Monitor to review the request-for-proposals ("RFP") evaluation criteria and process to ensure a fair and equitable RFP evaluation is performed in comparing bids against each other as well as against the MCCCG.

### **2. Market Cost of Comparable Conventional Generation**

MCCCG, as used in the evaluation of renewable energy bids and as used in the context of determining the above-MCCCG costs of purchased renewable energy for recovery in the REST Adjustor Mechanism calculation, is determined from market costs based on bids received from our pending purchases of conventional energy sources RFP process and/or the cost of UNS Electric's generation depending on the type of purchased renewable generation resource (firm, non-firm, dispatchable, etc.) and the market conditions at the time of the renewable purchase.



This above-MCCCG portion of purchased renewable energy resources is recovered under the REST Tariff Surcharge as determined in the REST Adjustor Mechanism calculation, whereas the portion of the cost of the renewable energy purchased that is at or below the MCCCG is recovered in the base generation rates. It is therefore important for the proper allocation of generation costs that the MCCCG of the purchased renewable generation be known with precision.

An MCCCG conceptual definition and matrix document, attached as Attachment 2, was developed to determine the applicable market conditions and the type of the purchased renewable generation resource for which the MCCCG is to be evaluated. The matrix is based on the renewable energy technology type employed and the market conditions, along with dispatch conditions at the time of the production of the renewable energy under evaluation. The MCCCG calculation will be dependent on the hour of the day, the season of the year and the month. The MCCCG will be evaluated for true up as part of the REST Adjustor Mechanism Tariff Surcharge calculation at the end of each year by running UNS Electric's PROMOD model software against the purchased renewable generation costs. As discussed above, the cost of the purchased renewable generation above the MCCCG costs will be included in the REST Tariff Surcharge as determined in the REST Adjustor Mechanism calculation.

UNS Electric undertook a study that applied the matrix to the 2006 actual generation market conditions and proposed generation profiles of wind generation and around-the-clock generation bids received in 2007 to determine the MCCCG of the renewable energy options. The evaluation resulted in MCCCG values for each of UNS Electric's meter billing periods. These hourly MCCCG values were then applied against the hourly generation profiles for the three lowest cost-option renewable generation proposals offered in response to UNS Electric's 2007 RFP for renewable generation. For wind power produced in New Mexico, the above-MCCCG cost was \$ [REDACTED] per MWh, for wind power produced in Arizona, the above MCCCG cost was \$ [REDACTED] per MWh, for an Arizona landfill gas location the MCCCG was \$ [REDACTED] per MWh and for solar power produced in Tucson it was \$ [REDACTED] per MWh. See Attachments 3, 4, 5 and 6, respectively, but these attachments are not provided with the redacted version of this Implementation Plan.<sup>1</sup>

### 3. Transmission

All of the wind renewable energy resources evaluated for MCCCG are located at least 150 miles from Mohave or Santa Cruz Counties. Thus, transmission on existing or new lines will be required to bring the energy from these resources to the customer loads in those locations. Nevertheless, UNS Electric believes the REST goals for 2008 through 2010 are not of large enough magnitude to require additional transmission to support purchased renewable power delivery to UNS Electric planned under the Implementation Plan. However, it is very likely that the resources needed to meet the 2011 and future REST goals of UNS Electric will require

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<sup>1</sup> The UNS Electric REST Implementation Plan contains confidential information. Accordingly, the Company is filing a redacted public version of the UNS Electric REST Implementation Plan. A non-redacted version of the UNS Electric REST Implementation Plan is being provided to Commission Staff and other parties to this proceeding upon execution of a confidentiality agreement.

additional transmission between the windy areas of Arizona north of the Mogollon Rim and the UNS Electric population centers. It is important that the transmission planning process include the needs for moving renewable energy from the resource sites to the population centers. It is also important that the Commission determine an appropriate transmission expense recovery method in advance of the need to build these transmission lines to ensure investor confidence in financial support of the transmission line construction. It is not yet clear if additional transmission will be required or, if it is required, what would be appropriate venue in which to recover the expenses of such transmission. In some cases, as discussed below, strategically located energy storage could mitigate the need for additional transmission. Consequently, we do not propose any expense recovery mechanism for transmission in support of renewable energy resources at this time, but reserve the right to propose such recovery in future years.

As UNS Electric transitions to a low-carbon, sustainable generation portfolio with energy storage over the next 100 years while supporting continued customer growth and the transition of transportation technologies from a base of fossil fuels to electric energy based sources, there may be an increased need for additional transmission capacity from the more remote areas of Arizona, where wind generation and central solar generation is most cost effective, to the population centers. However, effective use of optimally located energy storage in combination with the location of central solar generation at the sites of existing power plants and customer sited renewable generation could reduce the need for additional transmission. Further study and evaluation is needed in this area. For this reason, UNS Electric does not recommend any specific additional transmission needs at this time.

#### **4. Renewable Generation Integration Management**

There are costs associated with the integration and load-balancing of intermittent renewable resources such as solar or wind. The current lowest-cost renewable energy resource available to UNS Electric is wind generation. Many studies have been published of the costs of integrating wind generation into a utility generation portfolio, most recently by Idaho Power in citing a cost of over \$10 per MWh for integration using hydrogeneration resources for balancing. Studies performed by Tucson Electric Power ("TEP"), which have been recognized by a recent \$100,000 grant award from the Department of Energy to develop evaluation methods for determining the capacity value of solar generation to utilities, indicate that solar generation without some integrated energy storage – both central plant and distributed – has a much greater time-variant percentage fluctuation in output than does wind generation over the same time frame. Preliminary studies by TEP and Carnegie Mellon University indicate geographic diversity is not as effective in reducing the high level of variation in the output of solar generation as it is for the output of wind generation. While the cost study for integration of solar energy into a utility generation portfolio is not yet complete, UNS Electric does not expect that the cost of managing the integration of both time variant renewable generation sources, solar and wind, will be more than an insignificant factor until the year 2011, based on the lower initial REST annual energy percentages in the early program years. UNS Electric will use the data taken in the years prior to 2011 to evaluate the cost impact of integrating wind and solar generation with its existing fueled generation portfolio. After 2011, UNS Electric expects to include a factor for recovery of integration costs in its REST Tariff through the REST Adjustor Mechanism, and thus requests approval of that factor, not the amount of the charge, at this time.

## 5. Distributed Generation

The REST requires that affected utilities satisfy a percentage of their annual renewable energy requirement through the addition of distributed energy resources. The required DG percentage for the current implementation period begins at 10% of the 1.75% total requirement in 2008, and increases to 30% of the 3.5% total requirement in 2012. That percentage remains at 30% of the total renewable energy requirement through 2025.

Considerable public discussion has surrounded the DG targets described in the REST. This discussion has centered on questions related to the magnitude of customer interest in DG, the effect of introducing many new distributed technologies, the ability of the technology suppliers and installers to meet the potential customer demand, long term reliability of these technologies and, ultimately, the total cost of incentives required to drive the required customer participation to meet REST compliance. The extent of customer participation is the primary driver of DG results and it is simply unknown and unknowable at this time. UNS Electric's three years of experience with its SunShare Incentive Program demonstrated that changes in public policy affecting the program (i.e., state and federal tax incentive increases) and changes in program incentives can have dramatic impacts on customer participation, in some cases beyond those anticipated and positive results can be location specific. There is virtually no way to accurately predict whether the amount of incentives being offered will motivate customers in all parts of the service territory to participate at the necessary rate for full REST compliance. This is particularly germane, because even with availability of significant incentives, customers must still provide significant personal funding in order to have DG systems installed on their homes or businesses. Today, the typical residential distributed photovoltaic system costs about \$21,000 to install, attracts about \$10,000 in government and utility incentives, and requires a customer investment of about \$11,000.

UNS Electric recognizes that DG is an important component of the renewable energy goals of the REST, and proposes a funding level believed necessary for compliance. UNS Electric recognizes that uncertainty exists with respect to the proposed incentive levels and the total number of RECs that they will generate; however, in order to comply with the DG targets, UNS Electric believes this funding level is necessary if consumer demand for DG is adequate to meet the REST DG annual energy requirements. The assumptions used to build the DG program budget are based on incentives developed as part of Commission Staff's UCPP working group, market insights from those same meetings, and UNS Electric's experience with its SunShare Program modeled with customer payback term scenarios and current federal and state incentives. If the DG program assumptions prove to be correct, the first-year cost for the DG component is estimated to be approximately \$3.9 million. This amount escalates to approximately \$9.1 million in 2012. UNS Electric expects in this Implementation Plan to purchase all REST DG credits through its SunShare program offerings as described in the UCPP program below.

UNS Electric believes that customer-sited renewable DG systems are part of the long-term goal of a sustainable, Arizona self-sufficient energy supply for our customers. Thus, a Uniform Credit Purchase Program ("UCPP") is proposed to be offered for our customers who install and operate renewable DG systems.

UNS Electric has also implemented a true net-metering program, approved by the Commission in 2004; instituted a solar energy system rebate program, SunShare, approved by the Commission in August 2004; and has established a simple one-page, one-step residential solar or wind interconnection application process. While development of distributed renewable generation will reduce UNS Electric's need to produce electric energy from fossil fuels to meet its customer's energy needs, central or distributed solar and wind generation have demonstrated over three years of UNS Electric renewable energy production and SunShare experience that they are not able alone to meet the firm capacity or voltage control requirements essential in providing safe, reliable electricity service to all of our customers. Historic data indicates there is nearly zero firm-capacity benefit from the installation by Mohave County- or Santa Cruz County-based customers of distributed solar and wind generation systems to UNS Electric at the time of annual peak loads due to typical monsoon conditions that drive the peak loads, yet generally cover the sky with clouds as the loads peak.

There are both additional benefit factors as well as additional cost factors to UNS Electric from customers installing and operating renewable DG systems at their homes or businesses. Distributed Generation can provide benefits to both the customers owning the DG as well as to the utility in whose distribution system the DG has been installed. There are also costs from the installation of DG to both the owner of the DG and the utility. If the DG output is not time-variant the benefits are demonstrably higher and the costs lower to both the DG owner and the utility. However, if the output is time variant or is a function of weather patterns which can affect peak utility system demand, such as monsoon cycles, the benefit of the DG for firm capacity support is significantly reduced. Other benefits include: (1) reduced line losses, (2) increased life for current induced heating devices like transformers, (3) reduced water consumption at generating plants, (4) reduced emissions from conventional generating plants, and (5) reduced impact from the recovery and transportation processes used to provide fossil fuels for conventional generating plants.

Costs of DG to the owner include the cost of any required fuel, operation and maintenance costs ("O&M"), initial installation costs and ownership costs including financing, taxes and insurance associated with ownership of a generation system. There are also costs to the utility from, among others: (1) the increased need for rapid response automatic voltage control and load management devices in the distribution systems, (2) increased hardware to provide proper protection to distribution circuits with high percentages of DG installed, (3) additional repair time after a storm to clear DG sources prior to start of work, (4) increased outage recovery time from uncontrollable - to the utility - DG resources that start generating automatically in an unpredictable manner, and (5) lost revenue from the reduced sales of electricity with consumption only based rate structures. The quantification of these benefits and costs is very much utility-specific and of fairly low magnitude at the low levels of DG penetration expected in 2008 through 2010. While accurate, valid data is also difficult to obtain at low levels of DG penetration, over time as DG installations increase the data quality and quantity will improve and benefits and costs of renewable DG will be accurately quantified.

Net-metering programs provide an added benefit to the DG owner by providing a credit at the retail rate for generation output produced in excess of use over a given time period. For time

variant non-dispatchable DG systems like solar or wind, this can be a large benefit as DG output cannot be easily scheduled by the owner to match demand. Utilities can positively impact a decision to install DG by offering net metering programs for time variant DG systems and by eliminating or reducing the cost of the interconnection to the utility grid. Utilities can also positively support installation of DG by eliminating or reducing backup capacity and energy fees, charged to a DG customer when the DG system is not operational for planned or unplanned reasons. Utilities positively support renewable DG systems, such as solar generation, through providing rebate programs to reduce the initial cost of a DG system or through providing production-based REC purchase programs to provide an ongoing revenue stream for the owner to offset O&M and ownership costs.

Utilities receive a benefit from DG systems primarily from dependable reductions in peak annual demand from the generation output of DG systems during high load-demand hours. Firm, guaranteed reductions in peak demand allow utilities to reduce requirements for building generation, transmission and distribution capacity. However, if the DG generation is not firm and guaranteed to a very high degree of confidence over many annual load cycles, the utility cannot reduce its planned capacity requirements from customer installation of DG. Utilities will benefit from fuel use reductions and reductions in distribution losses through DG installation, effectively the variable portion of energy production expenses. There can also be a benefit to utilities from an increase in operational life for various distribution components, such as transformers and underground cables whose life is reduced by operation at elevated temperatures, created in part by high electrical loads. However, this benefit is also heavily dependent upon the ability of the DG to provide firm, highly reliable output during the highest load demand hours of the year. Thus, to a utility, the benefit of DG is a very large function of the capacity credit assigned a generator based on its proven ability to provide electrical generation output during the peak load demand hours of the year for that utility.

The costs of renewable DG to a utility include the direct cost of any rebates or production payments made for renewable generation, as well as internal and external labor or consultant costs of reviewing interconnection plans and providing interconnection devices to DG installers. However, in many cases, the largest cost to a utility from installation of DG systems is lost revenues from energy-only based utility rates, as a DG system reduces the energy consumption of the owner. The DG owner still must have a distribution drop to their premises, the distribution, transmission and generation capacity must still be available to support demand, the meter must still be read and bills prepared, remittances processed and administration of the utility provided.

A time-variant DG system does reduce utility annual fuel use and line losses in the distribution system. However, since the energy-based utility rate DG owner uses less energy per billing cycle, that owner will be providing reduced amounts of revenue to the utility to compensate for those services which the utility is obligated to continue providing and the DG owner requires for continuity of service. This can be addressed through partial requirements tariffs, backup service charges, an increase in the monthly fixed service charge and other rate mechanisms designed to provide a decoupling of the fixed cost of providing electrical service from energy production based related charges. Decoupling of rates from consumption can reduce this negative impact and more closely align the financial interests of customers and utilities for support of self-

generation. UNS Electric requests approval of a REST Performance Incentive to provide some timely recovery of this lost revenue as a component of the REST Tariff Surcharge as determined in the REST Adjustor Mechanism calculation. A per-kWh tariff equal to the average per-kWh of the fixed monthly charges, applied to the DG output could also be used to compensate utilities for the loss of fixed charge revenue from DG customers with self-generation installations, but is not being requested by UNS Electric at this time. This Performance Incentive program is addressed in the REST Application.

Time-variant DG output would appear to a utility control system as variable negative load. If the amount of DG output variance exceeded the amount of load variation normally experienced by the utility, it could result in the need for additional high ramp rate peaking generation or storage capacity, beyond what would be required without the time variant DG installations. The cost of installation and operation of natural gas fired high ramp rate capability firming generation, or electrical energy storage is an additional cost to a utility for support of time variant DG sources in its service territory. The installation of rapid change, time variant DG, coupled with the current inability of solar generation systems to provide reactive power, may also adversely impact the ability of existing utility voltage control devices, primarily slow response capacitor banks, to adjust reactive power flows to support local distribution system voltage in a sustainable, reliable manner during cloud passing events. Additional grid regulation support requirements, such as low voltage ride-through, droop support and frequency stability regulation are not currently provided by grid-connected solar generation systems and will consequently need to be provided in greater quantities by utilities in the future, with the associated cost of installation, maintenance and operation of these control devices.

Due to the relatively small amount of renewable DG installed in any North American utility service territory, there is not sufficient verified cost data to accurately and unambiguously determine the cost or benefits of renewable DG to UNS Electric. Therefore, UNS Electric does not propose an allowance for indirect costs or benefits of renewable DG be applied to increase or decrease the expenses UNS Electric will incur in offering a renewable DG incentive program at this time. The REST Adjustor Mechanism will reflect recovery of all actual direct expenses of the renewable DG program. In the future, as verifiable cost and benefit data is available from renewable DG programs with significant participation in the UNS Electric service territory, the Company will apply those indirect factors to the REST Adjustor Mechanism value calculation.

### **C. Required Program Funding**

The Plan proposed by the Company is estimated to cost a total of \$35.4 million over the five-year period covered by this Plan. This Plan is designed to achieve compliance with the REST requirements. The cost for the first program year (2008) is estimated to be approximately \$4.3 million and increases to \$10.4 million in 2012, driven mainly by the increasing energy targets. In this Plan, UNS Electric is requesting a REST Tariff Adjustor Mechanism surcharge to recover only the estimated 2008 costs of approximately \$4.4 million, resulting in a \$3.9 million increase over the approximately \$0.6 million currently collected from the EPS surcharge. In each succeeding year, as part of its Implementation Plan, UNS Electric will request a reset of the adjustor to collect the estimated costs for the following calendar year and true-up revenue received and expenses incurred for prior REST program years.

Several of the attachments contained in this Plan include pricing estimates that have been made by UNS Electric in development of the program costs. Some of the pricing included in this Plan is pricing from existing confidential proposals. The price estimates are necessary to allow UNS Electric to provide the information sought by the Commission as part of the background and support for the Implementation Plan. In addition, summary expenditures and energy requirements for generation provided on a year by year basis could be used to infer much of the confidential pricing information. UNS Electric believes it is in the best interest of the Company and our customers to ensure that future suppliers of renewable resources compete for the right to supply renewable energy without a pre-conceived notion of the pricing assumptions or confidential pricing in this Plan. Therefore, UNS Electric has submitted a redacted version of that confidential information and will provide Staff the competitively confidential information pursuant to an executed Confidentiality Agreement.

This Plan makes reasonable assumptions concerning renewable energy resources, and as UNS Electric gains more experience with renewable resources, future plans will account for the realities UNS Electric encounters in the actual implementation of the REST.

### **III. UNS ELECTRIC'S REST IMPLEMENTATION PLAN**

#### **A. Energy**

The minimum annual percentage of a utility's retail sales that must be obtained from renewable resources is identified in the REST; the Plan's first-year target for 2008 is 1.75%. The renewable resource targets required to meet UNS Electric's targets for each year are detailed in Attachment 1. The REST targets are described in two categories, renewable generation and distributed generation resources.

Renewable generation consists of projects that export their energy production to the utility. These projects are typically large-scale facilities that use renewable resources such as wind, solar, geothermal, biomass, and biogas to generate electricity. Energy produced from those resources is delivered through transmission and distribution systems and, ultimately, to the utility's customers.

Distributed generation resources represent technology applications that are physically installed on the customer's property. These applications are usually designed specifically for the distributed setting. Distributed applications under the REST would include a wide range of technologies; these technologies are currently most frequently represented by photovoltaic and solar water heating systems. The DG displaces some of the customer's energy needs, and can be tied to the existing UNS Electric distribution system or installed as a remote application independent of the UNS Electric distribution system. UNS Electric does not plan to install DG at customers' properties other than through our GreenWatts-funded community leadership sited projects; rather, the installation of DG is facilitated by providing customers with financial incentives for the installation of such resources by licensed contractors.

## **B. Capacity**

There are no capacity (in kW) requirements in the REST targets, but rather requirements are energy-based (kWh) only. However, this Plan utilizes historic generation capacity assumptions to forecast compliance with the energy targets. When one is equating energy targets to planned capacity levels, it is important to recognize that the capacity factors for various renewable generation technologies vary significantly. Some technologies, such as biomass and geothermal, are predictable and can produce energy at capacity factors of approximately 80-90%, similar to conventional-base load generation. Other renewable generation technologies, such as solar, are less predictable and have inherently low capacity factors of 15-30%, which are driven by daily fluctuations such as the availability of solar radiation and are influenced by location. There are other renewable generation technologies, such as wind, which are less predictable on a real-time basis. On an annual basis, however, wind will generally produce capacity factors in the range of 25-35%, depending upon the characteristics of the wind resource in a specific location.

A key factor in reaching a target, therefore, is the combination of technologies utilized, and the ultimate mixture will dictate the additional capacity required to achieve the energy targets. Attachment 1 provides the level of capacity for the specific mixture of technologies assumed for the coming five years. This material is not intended to be an exact representation of the resources UNS Electric intends to acquire, but rather is offered as an example of a potential resource mix, based upon UNS Electric's current understanding of the marketplace. The economics of a particular technology or resource will ultimately determine the extent to which any one technology is employed as part of the overall portfolio's content.

## **C. Renewable Generation**

This Implementation Plan has been designed for sufficient flexibility in order to provide the maximum opportunities to meet or exceed the REST target at a reasonable cost. The following sets forth descriptions of the expected resource additions over the next five years.

### **1. Existing Renewable Generation**

UNS Electric presently has no power purchase agreements ("PPA") for renewable generation resources. However, UNS Electric owns and operates approximately 0.008 MW of solar capacity. The composition of the existing portfolio is detailed in Attachment 7.

### **2. Renewable Generation Procurement Plan and Process**

Energy required to meet the UNS Electric targets and the anticipated demand for renewable rates in each of the next five years is outlined in Attachment 1. Generally speaking, two to five years is required from the initiation of a project via a Request for Proposal (RFP) to the point at which energy can flow into the UNS Electric system from a completed renewable generation project. The development and construction of the project itself accounts for the majority of that time period; therefore, an RFP process started in 2007 may realistically be expected to result in producing renewable energy applicable to the renewable resource target in 2009 at the earliest.



UNS Electric estimates that it will need additional amounts of renewable energy commencing in 2008, in addition to that which has already been built. As a result, UNS Electric implemented a competitive procurement process in 2005, 2006 and most recently in 2007. The competitive procurement process consists of, but is not limited to, the issuance of RFPs, negotiated bilateral supply contracts, and other competitive solicitations seeking long-term renewable resources. Implementing an effective competitive procurement process will ensure a fair and unbiased procedure that will efficiently incorporate a full range of renewable resource alternatives from the marketplace. However, until a long-term funding source is available through Commission approval of the Implementation Plan and its associated REST Tariff, UNS Electric is not able to consummate a renewable energy PPA at above-market prices.

During the evaluation of submitted bids during the competitive procurement process, UNS Electric's review of proposals will include analysis of: energy production; capacity value; deliverability; technical characteristics; operational performance; reliability; efficiency; credit worthiness; grid impact mitigation; and respondent experience. The procurement and project selection procedure employed by UNS Electric has been documented and certified to be fair and appropriate by an independent auditor as required by the REST.

UNS Electric's Implementation Plan attempts to fully acknowledge the reality that PPAs and project development methods will not necessarily conform to required delivery schedules and planned quantities. Renewable generation projects, like other generation projects, may fail to achieve scheduled commercial operation. A recent review of renewable projects in California stated that utilities should expect that 20-30% of renewable contracts would experience termination or major delays. Delays or failures of that magnitude could cause UNS Electric to fall short of its renewable energy targets. Thus, such risks require UNS Electric to design and employ contingency measures. In order to prevent energy shortfalls resulting from these risks, a procurement goal of 120% of the target energy for three to five years into the future will be employed.

### **3. Identifying Renewable Generation Requirements**

The renewable resource targets increase from 1.75% in 2008 to 3.50% in 2012 during the five-year period of this Plan. The Plan focuses on existing and planned renewable resource projects to meet those targets. It is also contemplated that new renewable generation will be contracted for and developed during that five-year period. It should be noted that UNS Electric has based its program's budget and energy procurement on several assumptions that are mentioned in the discussion that follows. Some details are competitively confidential; that information has been redacted but will be provided to Staff pursuant to an executed Confidentiality Agreement.

#### **a. Costs of Renewable Generation**

The costs of renewable generation are based for the purposes of resource and budget planning upon the portion of the renewable energy cost that is above the Market Cost of Comparable Conventional Generation (MCCCG). The value amount above UNS Electric's cost for comparable generation was established at the time the bids of proposed contracts were evaluated, and that value is applied to the total proposed purchased power cost for the planning

year. For future contracts, the price is estimated based upon existing renewable generation contracts, recent market experience, and general trends observed in renewable generation project development. Subsequently, these numbers will be re-evaluated during subsequent five-year planning periods. All renewable resource costs are described in terms of dollars per megawatt hour ("MWh") above UNS Electric's comparable conventional generation values. The detailed cost assumptions used to develop the budget for procurement of these resources are included in Attachments 3, 4, 5, and 6. Again, this information is competitively confidential and will be provided to Staff pursuant to an executed Confidentiality Agreement.

#### **b. Planned Resource Additions**

The REST renewable targets' annual increases suggest that renewable generation resources can be developed and procured in increments sized to match annual increases. However, a utility's ability to add renewable resources in amounts that specifically match the requirement is unlikely. Therefore, in some years the renewable generation procured will exceed that specifically targeted; these excess additions are sometimes referred to as "non-linear additions." The schedule of resource additions provided in Attachment 1 identifies specific targeted additions of renewable resources. The planning model incorporates an assumed-capacity factor for each renewable technology. The modeled capacity factors are based on UNS Electric's review of technical performance data for each technology, discussions with project developers, and a review of published information related to currently operating commercial renewable resources.

#### **D. Distributed Generation**

UNS Electric has identified DG as an important component of the renewable energy goals of the REST, and, as part of this Plan, UNS Electric proposes a funding level it believes necessary for compliance each year to support the distributed generation program. UNS Electric recognizes that uncertainty exists with respect to the proposed incentive levels and the total number of generated Renewable Energy Credits; however, in order to comply with the DG targets, UNS Electric believes that the proposed funding level is necessary to accommodate required consumer demand for DG.

As a result, UNS Electric has requested a level of funding for its first REST Tariff Adjustor Mechanism necessary to recover only the 2008 estimated expenses for the DG program. Increases in the adjustor will be required in future years for UNS Electric to meet the DG requirements in the REST. UNS Electric believes that adjusting the funding annually allows UNS Electric, working with the Commission, to implement a flexible program with a clear understanding of program performance and costs without over-collecting funds from customers in the near-term or compromising the overall resource goals of this Plan and the REST.

The Commission's Staff initiated the UCPP working group described in A.A.C. R14-2-1810 in June 2006, and UNS Electric participated in all of the working group's efforts. UNS Electric has generally used the approach developed by the UCPP working group for the Company's proposed DG incentive program, the UCPP. The working group has made significant progress towards identifying program workflows, technology-sensitive incentive structures and levels,

and technology-specific requirements and limitations. The efforts of the working group also provided UNS Electric with insight into the anticipated potential contributions from technologies not previously included in UNS Electric's SunShare programs. Planning models, implementation strategies, and budgeting for the DG program were all designed with specific consideration for the UCPP working group's recommendations. In addition, UNS Electric relied on over three years' experience with its SunShare Program, as well as on continuing dialogue with many industry and consumer stakeholders.

## **1. Anticipated DG Program Outcomes**

UNS Electric has developed a set of planning tools to help anticipate DG program outcomes, both from energy and budgetary perspectives. In developing the anticipated program outcomes for this Plan, a number of assumptions about technologies and customer preferences were first necessitated. The assumptions included the anticipated number of categorical projects requesting incentives and the anticipated energy contribution from each DG project. Anticipated energy contribution is calculated by utilizing assumptions on average project size and average project production. The detailed assumptions were required for purposes of budget and planning, but are not intended to reflect allocations, funding caps, or preference for any one technology. These energy-production assumptions are set forth in Attachment 1.

Included in the UNS Electric UCPP are incentives drawn from the draft UCPP working group efforts. The UCPP, as generally described herein and as shown in Attachment 8, details different incentive types for use in the DG program. For planning purposes, assumptions about customer preference for the variety of incentive alternatives were utilized.

The UNS Electric-proposed DG budget, combined with these planning assumptions, results in specific outcomes as noted in Attachment 1. The actual results of program implementation may well be different from those anticipated by UNS Electric's planning efforts, as customers learn more about the variety of technologies and applications available as a result of UNS Electric's program marketing, advertising, and partnership-development efforts.

## **2. Key Components of the Proposed DG Administration Plan**

UNS Electric's distributed generation program is detailed in Attachment 8. The following describes several key common components of UNS Electric's program as set forth in the proposed UCPP.

### **a. Administration**

Project funding is not guaranteed until a reservation confirmation is provided by UNS Electric for each project. To receive a reservation and an incentive, applicants must follow the established reservation, installation, and inspection procedures.

### **b. Equipment and Installation Requirements**

The installed DG systems will be required to adhere to generally accepted industry standards, federal, state and local codes, all applicable regulatory requirements, and manufacturer

recommendations for installation and operation. Systems must be installed and warranted by an Arizona licensed contractor holding an active certification for the technology being installed, or in some cases by a residential homeowner if willing to accept a lower level of incentive.

#### **c. Incentives**

Incentives are designed to defray some of the costs of a system designed to offset a typical load of a customer. Systems qualifying for DG incentives cannot qualify for other utility incentives.

Residential: Customers applying for residential incentives may apply for a one-time payment based upon the DG system's capacity, or based upon the estimated first-year savings provided by the DG system, dependant upon the technology used. This type of incentive is referred to as an Up-Front Incentive ("UFI"). Residential customers can also apply for a production-based incentive ("PBI") as an option or if their warranty conditions are not sufficient to meet the UFI qualifications.

Non-Residential: Non-residential customers will either receive a UFI or a PBI, which is paid out over time. Projects receiving PBI payments are paid based on system energy output rather than on system capacity. Projects with a capacity less than or equal to 20 kW can elect to receive a one-time capacity based UFI; all others will receive incentives based upon production, a PBI.

#### **d. Non-Conforming Projects**

Those DG projects that fall outside of the standard administrative, equipment, or incentive requirements for UCPP projects or projects that are solicited by UNS Electric to achieve specific program goals may be eligible for incentives as non-conforming projects. These projects must be comparable to conforming projects in financial efficiency in order to be considered eligible for incentives.

#### **e. Customer Self-Directed Option**

Per the REST Rule, certain interested eligible customers are required to apply and declare the amount of the self-directed funding requested before May 1<sup>st</sup> of the year prior to the request for funding payment, effectively at least 60 days before the Implementation Plan is filed for the upcoming year. These projects must be comparable to conforming projects in financial efficiency to be considered for incentives. The amount of funds allocated to customer self-directed projects will be disclosed in the Plan for the next program year. For 2008, there will be no funds available for self-directed projects as no funds for such programs are expected to be collected under the REST Tariff in 2007. For details of the proposed Self-Directed Tariff, see the REST Application.

### **3. Distributed Generation Incentive Budgets**

UNS Electric's proposed DG incentive budget for the five-year planning window is described in

Attachment 9. The incentive budget is designed to result in half of the distributed energy to be from residential installations and half from non-residential. Annual increases in program budget are designed to accommodate both an increase in the DG energy target and to account for the increasing levels of commitment to PBIs, which are used primarily for non-residential DG resources. The incentive matrices incorporated as part of the UCPP describe incentive reductions every two years of the program. Those planned reductions were designed by the UCPP working group to reflect the anticipation that DG technologies will decline in cost as market penetration and product availability increases. Three specific allocations are described in Attachment 9. They include: non-residential UFI; non-residential PBIs; and residential UFIs.

The UCPP describes potential funding for customer self-directed projects. As part of the UCPP, a budgetary earmark is required in order to fund projects meeting the criteria of customer self-directed projects. No funds have presently been paid to UNS Electric as part of the REST, and therefore no projects currently qualify for customer self-directed funds or would in 2008. Consequently, no allocation for self-directed or non-conforming projects has been established in this inaugural Plan.

The annual funding level for DG incentives was established based upon the estimates of the renewable energy needed for compliance, anticipated consumer demand, projected sales and development time frames, variations in the levels of technology maturity, and availability of equipment for installation. Should it happen that funds collected for use in the DG incentive program are not fully subscribed within a program year, those funds will be applied to the next program year and allocated to achieve the required energy outcome between residential and non-residential projects. Those overcollected funds would reduce the amount of the REST Tariff Adjustor Mechanism Tariff Surcharge in the subsequent year.

#### **4. Marketing, Advertising and Partnership Development**

UNS Electric is committed to conducting an action-oriented marketing campaign that will not only inform and educate consumers about the importance of renewable distributed generation and its potential benefits to customers and the community at large, but also spur them into investing in renewable energy.

Education and community awareness are the catalysts for the shift in public attitude required to jump-start the robust solar energy market envisioned by political leaders and DG advocates. Information is the prerequisite in achieving real movement toward alternative energy solutions. But fostering enhanced knowledge on the subject is not enough; ultimately, the goal is to proliferate solar and renewable energy DG in the Mohave or Santa Cruz County areas.

The marketing campaign will take a three-pronged strategic approach: 1) identify key stakeholders and analyze their specific interests; 2) educate those stakeholders (such as residential customers, business owners, students and opinion leaders) about the nature and benefits of DG; and 3) create marketing messages that encourage customers to take action, while promoting incentives designed to make DG an attractive choice for customers to reduce their carbon footprint.

The following key marketing components are designed to bring DG into the mainstream:

- Create an actionable campaign that focuses on the benefits, improved reliability and environmental impact of DG, with the intent that consumers will see DG in a whole new light.
- Utilize media that will best reach our various stakeholders through both paid and public service messages, as well as earned media.
- Develop collateral pieces for both residential and non-residential customer acquisition.
- Heavily promote the DG program on [uesaz.com](http://uesaz.com) and through customer communication vehicles such as bill inserts, e-newsletters and bill messaging.
- Maximize participation in green expos and other targeted community-wide events.
- Create and promote solar-based educational programs for the schools.
- Identify and solicit the support of "change agents" in the community who can effectively influence key stakeholder groups.
- Partner with various media outlets and vendors to develop co-promotions based around distributed generation; provide supporting collateral such as site signage and counter displays for added promotional support.
- Expand partnerships with area solar installers by continuing to provide technical expertise and collateral materials as well as sharing industry news and product updates.
- Escalate UNS Electric's involvement in the community dialogue about energy sustainability, lending expertise and experience through existing networks, ranging from classroom presentations and demonstration projects to interaction with environmental organizations and homeowner associations.

UNS Electric and its TEP affiliate have been widely recognized for many years as a leader in the development and installation of solar energy systems. As a byproduct of that leadership, UNS Electric has cultivated relationships, and acquired industry intelligence, that can now be applied to the propagation of DG in the Mohave and Santa Cruz County areas.

The previously described marketing components are based on currently available data. As the campaign proceeds, UNS Electric staff will monitor and analyze results, and will consider modifications to the campaign that mitigate deficiencies or capitalize on successes.

## **E. Implementation and Administration**

As part of the development of a strategy and budget for REST implementation, a logical separation was created between 1) those elements required to support the renewable generation portion of the program and 2) the DG portion of the program. Renewable generation involves expertise in utility-scale technologies, competitive procurement and evaluation processes, project siting, utility integration, transmission- and distribution-related issues, complex contract negotiations, and contract management. The DG program will be a mass-market program involving thousands of individual interactions requiring customer communication, interconnections, inspections, customer billing, and a sophisticated system to monitor REC production. Certain UNS Electric resources will be used to support both portions of the REST, and these are discussed below.

### **1. Resources Required for the Renewable Generation Program**

A renewable generation program requires knowledge-area experts to identify those aspects of renewable generation procurement, engineering, and market analysis that are unique from those same areas in conventional energy operation, and to coordinate with the impacted operational areas of UNS Electric in order to seamlessly integrate renewable resource management into UNS Electric's standard utility business practices. These experts comprising the renewable generation administrative team include the personnel necessary to manage the program, which incorporates establishing policies and procedures, procuring renewable generation, handling contract administration and construction management, managing benchmarking and resource integration studies, and performing program monitoring and compliance reporting.

There are also UNS Electric employees supporting the program that are neither part of the administrative nor the implementation teams. These personnel are considered "non-incremental" and are required to support the general operations of the utility and have responsibilities that are not directly related to the distributed-generation program. These would include, but would not be limited to, employees within UNS Electric's regulatory, pricing, accounting, legal, contract administration, and meter reading areas.

### **2. Resources Required for the Distributed Generation Program**

The implementation strategy for the DG program was developed with the following goals:

- Developing an accurate, efficient and customer-friendly process.
- Integrating the program's processes into the general business operations.
- Creating a measurable process that responds to adjustments in the volume of program participation.
- Supporting the strategic marketing efforts of the program.

In order to accomplish these goals, a significant investment in program implementation and management is needed. The DG program represents a significant number of individual transactions, and each transaction impacts numerous parts of UNS Electric's business

infrastructure. Thus, implementation costs for the DG program are significant.

**a. Program Resources**

The program's personnel team is comprised of the human resources necessary to execute the DG incentive program. This includes the fixed-payroll personnel required to administer the reservation and interconnection applications and agreements, review system design for conformance with UCPP and interconnection requirements, process incentive payments, answer customer and installer questions about the program, and perform field inspections. It also includes the variable-payroll personnel required to program and install net or performance meters, label utility equipment to identify potential backfeed sources, and provide billing support to net-metering customers. Further needed are the employees required to manage the execution of the program, develop and execute the marketing and advertising programs, and provide ongoing program monitoring and compliance reporting. The number of implementation team members required is proportional to both the number of applicants at any one time and the number of program participants. Additionally, just as in the case of renewable generation resources discussed above, many non-incremental employees will also be needed to support the DG program.

**b. Material Costs**

In order to measure the actual amount of kWh returned to the grid by DG facilities, a DG performance meter as well as a standard utility meter must be utilized in UNS Electric's system. The incremental cost charged to the REST is the total cost of the performance meter in addition to the incremental cost of any net meters added as replacements for the standard utility meter.

The UCPP proposes to capture an annual meter-read for all DG systems generating electricity for compliance verification and program evaluation purposes. UNS Electric believes that many customers may also be interested in the ability to track total kWh generated by their system. To facilitate both the meter-read capture requirement and to assist customers track the kWh production by the DG system, UNS Electric plans to install and read the system performance meter for all participants in the program. The only costs charged to the REST are those costs associated with providing the second meter to record system production. There are also incidental material costs associated with the program including, but not limited to, system locks, tags, inspection tools and transportation for inspection personnel.

UNS Electric may also install an interval-recording meter on a certain number of sites that will be used by load research to conduct studies on the coincidence of solar output vs. UNS Electric system load. The only material cost charged to the REST Implementation Plan Program will be the incremental costs of the interval recording meter.

**c. Technological Improvements Required**

For UNS Electric to effectively and efficiently implement the DG incentive program, it will be necessary to integrate with its existing systems, including customer billing, the program and operations databases, accounting systems, and dispatch and scheduling tools. This investment is required to ensure integrity and support the scale of the program as it is described in the Plan.



The technology tools to support the distributed incentive program that UNS Electric will develop and integrate into existing systems include:

- Agreement-processing and workflow-management tools — These tools will provide an interface through the [uesaz.com](http://uesaz.com) website to allow customers and vendors to complete and submit all program forms and agreements on-line, with data to be stored in a central database. They will include an integrated workflow-management component to provide status tracking, work orders, and scheduling. The tools will also integrate into all major systems, including the billing system, and the operations and accounting databases.
- Performance information tools — The readings from the system performance meter will be integrated into the UNS Electric billing system.
- Meter Database Management — The readings from the bi-directional meter will be integrated into the UNS Electric billing system. The credit for the energy sold back to the UNS Electric system will be calculated within the billing system and will appear on the customer's standard UNS Electric bill.
- Reporting and maintenance — Data capture necessary for ongoing program monitoring and compliance reporting will be facilitated by developing standard reports and a reporting tool for *ad hoc* queries.

#### **F. Renewable Technology Commercialization and Integration**

UNS Electric proposes a budget allocation for studies related to commercialization and integration of renewable resources. The purpose of this budget allocation is to enhance and accelerate the development, deployment, commercialization, and utilization of renewable resources for the benefit of UNS Electric customers.

Commercialization and integration studies to help meet the accelerated REST goals for renewable resources will be prioritized. As part of UNS Electric's long-standing commitment to renewable resources, several studies related to commercialization and integration are already underway. Those studies and ongoing experience with renewable resources will help identify additional study subjects necessary to achieve program goals.

The activities undertaken as part of this program may be supported either by UNS Electric solely, or in partnership with other organizations and entities including private industry, public research institutions, and government laboratories. UNS Electric intends to take full advantage of opportunities to leverage state and federal research and development efforts and supporting funding opportunities when planning and funding these activities. UNS Electric will also strive to increase coordination efforts with other utilities, the U.S. Department of Energy ("DOE"), the Arizona Department of Commerce Energy Office, and national laboratories to realize greater investment of federal research funds in Arizona and specifically the UNS Electric service territory. UNS Electric also intends to coordinate more closely with Arizona universities to better utilize those resources.

Studies presently underway that are currently funded by the EPS include:

- Arizona Renewable Resource Study — Jointly funded by Arizona Public Service ("APS"), Salt River Project ("SRP"), and TEP/UNS Electric, the study represents an independent analysis of potential renewable resources in Arizona. The analysis is being conducted by leading energy engineering consulting group, Black and Veatch, and will effectively establish a baseline understanding of renewable energy resources presently perceived as available within the state. In addition, the study will define renewable energy technology applications, associated cost structures, as well as identify renewable energy market opportunities, which should encourage the development of renewable energy projects in Arizona. This study is complete and may be obtained upon request.
- TEP Solar Capacity Value Study — This study drives extensive research that leverages available high resolution solar generation data within Arizona and evaluates the potential for reliably incorporating utility scale and customer sited distributed solar generation into TEP's system. DOE has awarded TEP a \$100,000 grant to develop a specific solar capacity value evaluation method TEP proposed based on the data noted above. The initial report may be obtained upon request.
- Joint Utility Market Study — This joint effort will result in a statewide market study evaluating consumer receptiveness to the installation of distributed renewable energy equipment, particularly photovoltaic. Participants include APS, SRP, TEP/UNS Electric and the Arizona Cooperative Utilities.
- Concentrating Solar Power Project Studies — TEP/UNS Electric, in conjunction with several regional utilities, has formed a Joint Development Group ("JDG") to explore the possibility of issuing a joint-RFP for energy from a large-scale (250MW) solar plant. This effort is intended to provide project developers with energy and capacity levels large enough to drive cost-effective economics into the development of solar resources, in an attempt make solar generation more cost competitive with non-solar resources. The efforts of the JDG will require investment in project siting studies, along with specialized support for the development of an RFP.

In determining whether to fund new studies related to commercialization and integration, TEP/UNS Electric will consider three key functional areas:

- Renewable technologies and available resources: These include studies of the attributes, characteristics, and costs of renewable energy technologies and the availability and viability of renewable energy resources in the state of Arizona and the western United States. Specifically, TEP/UNS Electric believes it is valuable to explore geothermal resources, monitoring and forecasting of wind resources and evaluate attributes specific to solar sites for development.

- Transmission and system integration impacts: These studies would be designed to provide TEP/UNS Electric with a better understanding of the operational impacts, costs of integration, and for the identification of opportunities with renewable energy resources in the TEP/UNS Electric generation, transmission and distribution systems. TEP/UNS Electric recognizes the critical importance of transmission in the success of the expansion of renewable generation. Any significant increase in renewable generation must be integrated into the long-term planning for transmission to be successful.
- Distribution system impacts: These studies will examine the impacts of distributed generation resources on the power distribution system. Specific areas of study would include impacts on the general distribution system, design and construction, operations and maintenance, voltage stability, safety, power quality, and load forecasting.

#### IV. COSTS OF PROGRAM IMPLEMENTATION

The UNS Electric Implementation Plan cost is comprised of two key cost segments, renewable generation and distributed generation. A summary of the costs of those segments and the major components for each segment are included in Attachment 9. As seen in that attachment, UNS Electric currently estimates the cost to comply with the REST to range between \$4.3 million in 2008 to \$10.4 million in 2012, with a five-year total of \$35.4 million. The annual increases are driven mainly by the annually increasing energy targets.

The REST funding is intended to cover the cost of utility-scale renewable generation in excess of the market cost of conventional resource alternatives, incentive payments for distributed energy resources, marketing expenses, and program implementation and administration costs. The costs for renewable generation are based on UNS Electric's most current insights into that market. The costs for DG incentives and the program budget are based on incentives developed as part of the Commission Staff's working group and UNS Electric's best estimations of market uptake for the various technologies available to consumers.

UNS Electric is presently requesting REST Surcharge funding of \$4.4 million for 2008. (The current EPS adjustor would generate approximately \$0.6 million in 2008, which means the increase for the REST adjustor is about \$3.9 million above what would otherwise be collected by the EPS Surcharge.) The requested REST Surcharge amount, with approval to use the estimated end of program in 2008 of \$1.9 million of unexpended EPS funds for REST programs would total the \$4.4 million of funding needed to provide a reasonable opportunity, but certainly no guarantee, for compliance with the REST requirements in 2008. It is UNS Electric's intent to request additional funding in each successive year for the following calendar year's estimated REST compliance cost. To illustrate, in 2008 UNS Electric will request funding for the 2009 calendar year as part of its Implementation Plan, and carry forward that methodology in succeeding calendar years. The estimates contained in Attachment 9 would be updated each year to determine the necessary level of funding from UNS Electric's customers.

## V. CONCLUSION

Arizona is beginning the transition from a fossil-fuel based primary energy foundation to a sustainable primary energy based foundation. The transition is needed to ensure that future generations of Arizona citizens have a long-term supply of safe, affordable, convenient energy on demand. As with all transitions, the first steps are the most expensive, difficult and uncertain. Currently, all Arizona sources of renewable energy come at a cost greater than any current fossil-fuel energy source. However, due to increased use of renewable energy, the cost difference is closing and in a decade or less, renewable energy may be at economic parity with fossil fuel sources. Technical challenges to the seamless integration of time variant renewable energy sources with dispatchable generation sources have been found. But, with proper planning, continuous data analysis and deliberate technology management, the challenges can be converted to opportunities and the path to sustainable energy integration can be smooth.

The EPS adopted by the Commission in 2001 provided UNS Electric with the opportunity, and, just as importantly, sufficient funding, to develop appropriate amounts of solar technologies, both in partnership with customers and at utility scale, to understand the basic tools that will need to be developed over the next decade to fully integrate solar energy into its generation portfolio. UNS Electric's proposed REST Implementation Plan and REST Tariff, when approved by the Commission, continues that transition to sustainable energy sources by setting a definitive, sustainable timeline and providing sufficient funding to support 15 percent of annual energy needs from renewable resources by 2025.

Arizona has the nation's best solar energy resource, wherein only 0.5 percent of Arizona's land surface, if covered with ten-percent-efficient solar generation and combined with efficient, inexpensive, reliable energy storage, could provide all of Arizona's current annual electric energy needs. Solar energy is Arizona's energy future. In 2100, we hope that future Arizonans will look back in history from their end of the timeline and wonder why there was a time when solar energy was not the energy source of choice. At our end of the timeline we know that the economics and technologies are not yet fully capable of economically and reliably supporting 100 percent of Arizona's energy needs from renewable resources. Commission approval of the proposed REST Implementation Plan and its appropriate funding through the proposed REST Adjustor Mechanism and the REST Tariff will challenge UNS Electric to continue its sustainable energy transition at an accelerated pace for the next two decades. UNS Electric looks forward to working with the Commission in obtaining approval of the REST Implementation Plan and REST Tariff, in working with its customers to develop DG projects throughout the UNS Electric service area, and in developing renewable energy as a whole.

# Attachment 1



# Renewable Energy Standard per 11/2006 Approved REST Rule. Full Compliance Opportunity Plan

UNSE-500

UNSE & REST Program  
Factors

Renewable Resource Energy and Power Conversion

Annual  
Credit  
Balance  
es MWh

Assumption

Residential Solar  
Electric Up Front  
Subsidy Payment  
UCPP Plan

Distributed Solar  
Hot Water & Wind  
Up Front Subsidy  
Payment UCPP  
Plan

Assumption

Generation Solar  
ed In Tariff Plan -  
non residential solar  
all years. UCPP

Item	2008	2009	2010	2011	2012
RES Annual Renewable Energy Percentage	1.75%	2.00%	2.50%	3.00%	3.50%
Energy Sales - MWh Growth @ 2.72%/yr	1,762,733	1,826,544	1,881,244	1,945,323	2,015,532
Expected DSM Program Annual Energy Reductions	3,815	7,810	11,948	16,428	20,878
Expected DG Program Annual Energy Reductions	0	3,078	5,447	9,319	14,397
Net Retail Energy Sales in MWh per Year	1,758,918	1,815,656	1,863,849	1,919,576	1,980,257
Renewable Energy - MWh	30,781	36,313	46,596	57,587	69,309
Minimum Distributed Energy %	10.00%	15.00%	20.00%	25.00%	30.00%
Minimum Distributed Energy MWh	3,078	5,447	9,319	14,397	20,793
Minimum Residential Distributed Energy %	5.00%	7.50%	10.00%	12.50%	15.00%
Minimum Residential Distributed Energy MWh	1,539	2,723	4,660	7,198	10,396
Maximum Commercial Distributed Energy %	5.00%	7.50%	10.00%	12.50%	15.00%
Maximum Commercial Distributed Energy MWh	1,539	2,723	4,660	7,198	10,396
Residential Distributed Generation - MWp Total New 60% Solar PV	0.444	0.970	1.831	2.959	4.381
Residential Distributed Energy - MWp Total New 40% Solar Hot Water/Space Heating & Wind	0.616	1.089	1.864	2.879	4.159
Commercial Distributed Generation - MWp Total New 25% Solar Electric PV	0.226	0.401	0.685	1.059	1.529
Commercial Distributed Generation - MWp Total New 75% Non Solar Electric @ ave 50% CF	0.264	0.466	0.798	1.233	1.780
Distributed Solar Elect MWp Old With Multipliers	0.24	0.24	0.24	0.24	0.24
Utility Solar Elect MWp Old With Multipliers	0.02	0.02	0.02	0.02	0.02
Utility Fueled Generation - MWp Old With Multipliers	0.000	0.000	0.000	0.000	0.000
Utility Generated @ 80% NonDispatchable Energy - MWp New No Multipliers - Wind	11.500	12.815	15.479	17.937	20.150
Utility Generated @ 20% Fueled - MWp New No Multipliers	0.632	0.704	0.850	0.985	1.107
Resulting Total Solar Electric Capacity in MW	0.918	1.488	2.633	4.135	6.027
Resulting Total Solar Electric Annual Energy in MWh	2,483	3,490	5,135	7,293	10,011
Incremental Solar Capacity Watts Installed per Year per Person	3,724	3,165	6,362	8,343	10,509
Resulting Total Distributed Solar Hot Water Heating Capacity in MW	1.000	1.770	3.029	4.679	6.758
Resulting Total Distributed Solar Water Heating Annual Energy in MWh	1,000	1,770	3,029	4,679	6,758
Resulting Total Distributed Non Solar Electric Dispatchable or Displaced Generation Capacity in MW	0.176	0.311	0.532	0.822	1.187
Resulting Total Distributed Non Solar Electric Dispatchable or Displaced Generation Annual Energy in MWh	770	1,362	2,330	3,599	5,198
Resulting Total Wind Electric Generation Capacity in MW	11.500	12.815	15.479	17.937	20.150
Resulting Total Wind Electric Generation Annual Energy in MWh	22,138	24,669	29,798	34,528	38,789
Resulting Total Biomass Electric Generation Capacity in MW	0.632	0.704	0.850	0.985	1.107
Resulting Total Biomass Electric Generation Annual Energy in MWh	5,535	6,167	7,449	8,632	9,697
Total Renewable Generating Annual Energy in MWh	31,926	37,458	47,741	58,732	70,454
Total Renewable Generating Capacity in MW	14.227	17.088	22.524	28.558	35.228
Residential Distributed Electric Credit Balance	0	0	0	0	0
Commercial Distributed Energy Credit Balance	0	0	0	0	0
Utility Generated Electric Credit Balance	1,494	1,484	1,469	1,449	1,424
Residential Distributed Generation Solar Electric %	60.00%	60.00%	60.00%	60.00%	60.00%
Residential Distributed Generation Up Front Solar Electric Subsidy Program \$/Watt DC	\$4.50	\$4.50	\$4.00	\$4.00	\$3.30
Additional Residential Distributed Solar Electric Capacity Needed in MWp this given Year	0.444	0.526	0.861	1.128	1.421
Subtotal Cost of Residential Distributed Solar Electric Subsidies	\$1,998,107	\$2,368,861	\$3,442,024	\$4,513,398	\$4,690,314
Residential Distributed Solar Hot Water & Wind Up Front Subsidy Program \$/Watt AC Equivalent	\$1.0000	\$1.0000	\$0.9000	\$0.9000	\$0.7500
Additional Residential Distributed Solar Hot Water & Wind Capacity Needed in MWp this given Year	0.616	0.474	0.774	1.016	1.279
Subtotal Cost of Residential Distributed Solar Hot Water & Wind Subsidies	\$615,621	\$473,772	\$697,010	\$913,963	\$959,382
Distributed Generation Solar Electric %	25.00%	25.00%	25.00%	25.00%	25.00%
SubTotal Cost of Distributed Solar Electric Generation Feed In Tariff	\$69,257	\$191,814	\$380,529	\$672,064	\$1,030,739
Unit Built in 2008	\$69,257	\$69,257	\$69,257	\$69,257	\$69,257
Unit Built in 2009		\$122,557	\$122,557	\$122,557	\$122,557
Unit Built in 2010			\$188,715	\$188,715	\$188,715
Unit Built in 2011				\$291,536	\$291,536
Unit Built in 2012					\$358,674
Unit Built in 2013					
Unit Built in 2014					



Distributed Generation Non Solar Electric Feed In Tariff Plan - Solar Thermal, Solar Cooling, Wind, Biomass & Daylighting. Applies to all non residential solar electric in all years. UCPP	Distributed Electric Feed Applies to all residential electric in all years. UCPP	Unit Built in 2015					
		Unit Built in 2016					
		Unit Built in 2017					
		Unit Built in 2018					
		Unit Built in 2019					
		Unit Built in 2020					
		Feed In Tariff Rate for 20 years \$/kWh	\$0.1800	\$0.1800	\$0.1620	\$0.1620	\$0.1380
		SubTotal Cost of Non Solar Electric Distributed Energy	\$57,714	\$159,845	\$317,107	\$580,054	\$871,944
		Feed In Tariff					
		Unit Built in 2008	\$57,714	\$57,714	\$57,714	\$57,714	\$57,714
Unit Built in 2009		\$102,131	\$102,131	\$102,131	\$102,131		
Unit Built in 2010			\$157,262	\$157,262	\$157,262		
Unit Built in 2011				\$242,946	\$242,946		
Unit Built in 2012					\$311,891		
Unit Built in 2013							
Unit Built in 2014							
Unit Built in 2015							
Unit Built in 2016							
Unit Built in 2017							
Unit Built in 2018							
Unit Built in 2019							
Unit Built in 2020							
Feed In Tariff Rate for 20 years \$/kWh	\$0.0500	\$0.0500	\$0.0450	\$0.0450	\$0.0400		
UNSE Generated Renewable Power	Above Market Premium of Self Generated or Purchased Renewable Power Including Transmission After 2009	\$0.0154	\$0.0154	\$0.0154	\$0.0255	\$0.0255	
	Cost of Self Generated or Purchased Renewable Power	\$424,840	\$473,402	\$571,821	\$1,101,457	\$1,237,372	
Other RES Program Costs	Grid Integration Rate in \$/MWh	\$0.00	\$0.00	\$0.00	\$2.00	\$3.00	
	Large Scale Grid Integration Costs in \$	\$0.00	\$0.00	\$0.00	\$43,190.45	\$72,774.45	
	Administrative Costs & Integration Costs & Outreach and Advertising & Net Metering costs	\$1,110,213	\$1,127,409	\$1,271,094	\$1,458,155	\$1,657,340	
DG Program Subtotal	Distributed Generation & DG Admin and DG Integration Program Costs	\$3,850,913	\$4,321,702	\$6,107,764	\$8,074,444	\$9,136,944	
Distributed Program % of Total Program	Percent of Total RES Program Costs	90.06%	90.13%	91.44%	87.58%	87.46%	
Total Program Expenses	Total REST Program Cost	\$4,275,753	\$4,795,104	\$6,679,586	\$9,219,091	\$10,447,091	
	Credit Sales MWh	0	0	0	0	0	
Program Revenue Streams	Green Sales MWh	6	10	15	20	25	
	Credit Sales \$/MWh	\$0	\$0	\$0	\$0	\$0	
	Green Sales \$/MWh	\$85	\$85	\$85	\$85	\$85	
	Renewable Product Sales Income	\$508	\$847	\$1,270	\$1,694	\$2,117	
	EPS Carryover Revenue	\$0	\$220,000	\$500,000	\$800,000	\$600,000	
	REST Surcharge/Sample Tariff Income	\$4,464,137	\$4,585,562	\$6,100,000	\$8,550,000	\$9,820,000	
	Investment Tax Credit	\$0	\$0	\$0	\$0	\$0	
	Finance Cost @ 10% or Investment @ 5%	\$0	(\$9,445)	(\$9,538)	(\$5,145)	(\$1,518)	
	Total EPS Program Revenue	\$4,464,645	\$4,796,964	\$6,591,733	\$9,146,549	\$10,420,600	
	Total EPS Program Annual Balance (Subsidy Program)	\$188,893	\$1,860	(\$87,853)	(\$72,542)	(\$26,492)	
Cumulative Program \$ Balance	Cumulative Gain (Loss) (Subsidy Program)	\$188,893	\$190,753	\$102,900	\$30,358	\$3,866	
Cumulative Program Cost	Cumulative REST Program Expenditures	\$4,275,753	\$9,070,856	\$15,750,442	\$24,969,533	\$35,416,624	
Variable Assumptions	Landfill Gas MWp	5 MWp					
	Central Solar Conversion Rate	1700 MWh/MWp					
	Distributed Solar Conversion Rate	1350 MWh/MWp					
	Distributed Renewable Conversion Rate	1000 MWh/MWp					
	Solar Thermal Conversion	2840 MWh/MWp					
	Dispatchable Conversion Rate	8760 MWh/MWp					
	Wind Conversion Rate	1925 MWh/MWp					

#### Assumptions:

UNSE manages the Distributed Generation Program 60% of residential distributed is solar electric. The other 40% is solar hot water and wind. Paid for with up front subsidy through 2012 25% of Commercial distributed is solar electric. The other 75% is solar hot water heating, solar cooling, wind, biomass or daylighting. Paid for with a 20 year locked feed in tariff after 2007 through 2030.

The cost of renewable energy purchased through RFPs and generated by UNSE in the future initially will be \$0.0154 per kWh above the market price for energy purchased at the same time the renewable energy was generated.

The cost of transmission after 2012 to bring the needed amounts of 50% wind to UNSE will be based on a transmission cost of \$0.035 cents per kWh on a 20% capacity factor line, in 2013 with reduction to market in 2030.

All renewable generation sources for UNSE can be integrated into the existing transmission structure through 2012.

This scenario does not include reductions from Global Solar credit production.

Energy sales and subsidy revenue growth is 2.72% per year. Assumes the REST reduces customer energy load growth due to the new self generation in and DSM reduces load growth also.

Annual energy production rates for the various technologies are based on historical data from the first five years of the UNSE EPS programs.

The Feed In Tariff program has less risk of problems associated with customer generation production than the Up Front Subsidy Program given that there Grid Integration Costs based on Xcel/Minnesota Dept of Commerce Report of 2004, Idaho Power Report in 2007 and British report of 2006.

Other REST Program Costs include: Interconnection application review costs, net metering costs, application processing costs, initial inspections, annual hearing costs.

There is no energy storage anticipated during the 2008 through 2015 time frame. Storage will be needed after 2015 if unpredictable energy sources like Administrative costs assume one person per 500/kWp per year of new commercial or residential solar installations and two technical gurus for all levels of Ongoing annual inspection and repair work will be contracted out.

Creation of a database with online access for customers and installers will add some cost in future.

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# Attachment 2



## **Conceptual Development of Market Cost of Comparable Conventional Generation for the proposed Renewable Energy Standard & Tariff**

Consistent with the Renewable Energy Standard & Tariff ("REST") Rules passed by the Arizona Corporation Commission ("Commission"), UNS Electric, Inc.'s ("UNS Electric") proposed Renewable Energy Standard and Tariff Implementation Plan contemplates recovery of expenses in excess of the Market Cost of Comparable Conventional Generation ("MCCCG"). The Commission provided guidance on defining MCCCG in the context of its REST Rules and identified the MCCCG as "the Affected Utility's energy and capacity cost of producing or procuring the incremental electricity that would be avoided by the resources used to meet the Annual Renewable Energy Requirement, taking into account hourly, seasonal and long term supply and demand circumstances. Avoided costs include any avoided transmission and distribution costs and any avoided environmental compliance costs." R14-2-1801.11.

The great bulk of Renewable Energy Standard program expenses are expected to be from procurement of renewable energy generation sources, both customer sited distributed generation and remote utility scale sources through purchased power agreements. There may be some internal renewable generation production sources built if the cost of purchased renewable energy is higher than self built options. The recovery of all expenses through the REST Tariff revenues will, to a very large degree, be affected by the methodology used to derive the MCCCG amount, expected to be an annual number. This document is intended to define the methodology for purchased power or for internally owned renewable generation sources. It may also be used as a comparison point for customer sited distributed renewable generation resource cost recovery.

The proposed method assumes that an annual revenue requirement figure will built up as a sum from a series of 8,760 (8,784 in a leap year) hourly figures comparing actual renewable generation resource costs for each renewable energy resource purchased or self produced in each hour of the year against the MCCCG in those same hours. The comparable hourly MCCCG may be different for different renewable sources, taking into account the firmness of the renewable generation resource, the curtailability of the renewable generation resource and whether native load requirements were met by internally owned or contracted generation resources or if market purchases were required to meet native load requirements. The following table provides a MCCCG evaluation matrix. The hourly MCCCG cost determination criteria is listed in the box selected by comparing the types of Purchased Renewable Generation with the Market Condition and Dispatch Type. This method of cost determination is very data intensive and will be evaluated at the end of each year by running UNS Electric's PROMOD model software against the purchased renewable generation. The cost of the purchased renewable generation above MCCCG costs will be included in the REST Adjustor Mechanism and REST Tariff.

## MCCCG Cost Determination Matrix

		Types of Purchased Renewable Generation			
Market Condition and Dispatch Type		Dispatchable Firm Renewable Generation: Fuel/Solar hybrid, Wind/Hydro hybrid, Biomass	Must Run Firm Renewable Generation: Dedicated Landfill Gas or Biogas	Must Run Non-Firm Renewable Generation: Run of Canal or River Hydro	Curtable Non Firm Renewable Generation: Wind or Solar without firming storage
	Selling to Market from In House Real and Contracted Generation Sources	MCCCG Cost Based on Incremental Production/Purchase Cost of Base Load Generation for that hour			
	No Market Transactions from/to In House and Contracted Generation Sources				
	Purchasing from Day Ahead Market, but not Spot Market, to meet Native Load Requirements	MCCCG Cost Based on Average Day Ahead Market Price of Purchased Power for that hour			
	Purchasing from Spot Market to meet Native Load Requirements	MCCCG Cost Based on Average Spot Market Price of Purchased Power for that hour			

Incremental Production / Purchase of Base Load - The cost of the next kWh (incremental) amount of load that has to be provided by TEP generation sources and/or purchased power. This will be dependent on the season, month and time of day.

If Day Ahead Market or Spot Market purchases are being used to provide for reliability support capacity to meet native load requirements by freeing up in house or contracted generation resources for regulation or spinning reserve purposes for support of native load requirements, that would still represent a Market Purchase for purposes of determining which matrix box is applicable.

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# Attachment 3

**REDACTED**



# Attachment 4

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# Attachment 5

**REDACTED**





# Attachment 6

**REDACTED**

# Attachment 7

**UNS Electric, Inc.**

**2006 Annual Report on  
Environmental Portfolio Standard Programs**

**Prepared for:  
Arizona Corporation Commission**

**Submitted: April 1, 2007**

## EPS Activity Summary

Pursuant to the Arizona Corporation Commission ("Commission") Order in Docket No. E-04204A-04-0304, Decision No. 67178, UNS Electric, Inc., a subsidiary of UniSource Energy Services ("UNS Electric") (formerly Citizens Communication Company, Mohave Electric Division and Santa Cruz Electric Division ["Citizens"]) presents its annual report on Environmental Portfolio Standard ("EPS") programs for the period covering January 1, 2006 through December 31, 2006.

Based on the percentage requirements of the portfolio standard, the following chart of MWh requirements has been used to forecast the UNS Electric EPS annual renewable energy needs:

EPS MWh Requirements

Year	UNSE/Citizens' Retail MWh Sales	EPS %	EPS MWh Required	Accumulated EPS MWh Required
Actual				
2001	1,275,036	0.20	2,550	2,550
2002	1,136,581	0.40	4,546	7,096
2003	1,392,466	0.60	8,355	15,451
2004	1,462,633	0.80	11,701	27,152
2005	1,520,947	1.00	15,209	42,361
2006	1,611,420	1.05	16,920	59,281
Projected				
2007	1,659,763	1.10	18,257	77,538
2008	1,709,555	1.10	18,805	96,343
2009	1,760,842	1.10	19,369	115,712
2010	1,813,667	1.10	19,950	135,662
2011	1,868,077	1.10	20,549	156,211
2012	1,924,120	1.10	21,165	177,376
Total	19,135,107		177,376	912,733

Surcharge revenues and program expenditures applicable for 2006 are summarized in Table 1. EPS energy totals for 2006 and program to date are shown in Table 2. The energy (kWh) output from UNS Electric's on-site photovoltaic stations is outlined in Table 3.

**Table 1**  
**Summary of EPS Programs**  
**Period from January 1, 2006 through December 31, 2006**

<b>Summary of Program Revenues</b>			
Description	Thru 12/31/05	Period 1/01/06 - 12/31/06	Life of Program
GreenWatts Total	\$3,973	\$6,302	\$10,275
Renewables Surcharge Total	\$2,270,053	\$550,207	\$2,820,260
Total EPS Program Revenues	\$2,274,026	\$556,509	\$2,830,535
<b>Summary of Program Expenditures</b>			
Hardware Buydown Program	\$62,878	\$168,051	\$230,929
Landfill Gas Credits	\$467,000	\$173,250	\$640,250
Marketing	\$19,235	\$20,060	\$39,295
Materials & Supplies	\$167	\$1,159	\$1,326
Outside Services & Contracting	\$400	\$4,589	\$4,989
Payroll	\$18,316	\$39,017	\$57,333
TEP Support Services	\$9,487	\$0	\$9,487
Training & Travel	\$967	\$6,358	\$7,325
Total EPS Renewables Expenditures	\$578,450	\$412,484	\$990,934
<b>Program Balance</b>			
	\$1,695,576	\$144,025	\$1,839,601

**Table 2**  
**Summary of EPS Energy Totals**  
**Period from January 1, 2006 through December 31, 2006**

Description	Cumulative Thru 12/31/05	Reporting Period 1/1/06 - 12/31/06	Cumulative Thru 12/31/06
Retail Sales, kWh	5,281,925,000	1,611,420,000	6,893,345,000
UES EPS Requirement (1.05% of retail sales for 2006), kWh	28,672,900	16,919,910	45,592,810
"Other" Credits Needed To Meet EPS Requirements (40% in 2006), kWh	11,469,160	6,767,964	18,237,124
"Solar Electric" Resource Credits Needed to Meet EPS Requirements (60% in 2006), kWh	17,203,740	10,151,946	27,355,686
"Solar Electric" Resource Credits Generated, kWh (Note 1)	337,476	221,190	558,666
"Solar Electric" Resource Credits Purchased, kWh (Note 1)	0	0	0
"Other" Credits Generated, kWh	0	0	0
"Other" Credits Purchased, kWh	18,680,000	6,930,000	25,610,000
Total "Solar Electric" Credits, kWh	337,476	221,190	558,666
Total "Other " Credits, kWh	18,680,000	6,930,000	25,610,000
Excess "Solar Electric" Credits Above Meeting EPS Requirements, kWh	-16,290,916	-16,698,720	-32,989,636
Excess "Other" Credits Above Meeting EPS Requirements, KWH	1,819,200	162,036	1,981,236

(Note 1) Includes extra credit multiplier, 2.0 for 2006

**Table 3**  
**EPS Solar Energy Production**  
**Period from January 1, 2006 through December 31, 2006**

KG	LH	NO	
		30	
	649		
		0	
	5,182		
	3,519		
2,518			
2,650			
18,780			
4,597			
	4,746		
	7,773		
	3,369		
	2,836		
	4,462		
	2,124		
	4,336		
	9,211		
	1,374		
	5,065		
	4,751		
5,367			
	571		
4,893			
3,706			
4,965			
	1,062		
	2,708		
47,476	63,089	30	kWh
		110,595	kWh

Total actual kWh generated for the year:

110,595\* 2.0 multiplier (in-state credits, distributed generation) = 221,190 kWh



Cumulative Solar kWh generated:

Year	kWh	Multipliers .5 Early Installation .5 In-State Installation .5 Distributed Generation	Total EPS kWh
1998	19,000	2.5	47,500
1999	19,000	2.5	47,500
2000	19,000	2.5	47,500
2001	19,000	2.5	47,500
2002	19,400	2.5	47,500
2003	13,333	2.0 (Early Install Multiplier Ended)	26,700
2004	9,978	2.0	19,956
2005	26,738	2.0	53,476
2006	110,595	2.0	221,190
Total			558,822

### **SOLAR PROJECTS TO DATE**

Two solar projects were initiated in 1997. The two systems installed by Citizens were part of a pilot project undertaken in partnership with a TEAM-UP utility working group. The group received funds from the federal Department of Energy through a partnering program with the Utility Photo Voltaic Group.

This solar project includes two sites:

Lake Havasu City:

- 2 Systems
- Each system comprised of 12 panels for a total of 24 panels
- Site output is approximately 4 kW
- Grid connected (no battery storage)

Kingman:

- 2 systems
- One system is comprised of 13 panels, the other has 14 for a total of 27 panels
- Site output is approximately 4 kW
- Grid connected (no battery storage)

In addition, to further meet the EPS requirements, UNS Electric purchased 6,930 MWh of Landfill Gas Credits from Tucson Electric Power (TEP), issued under EPS Credit Certificate No. TEP/UNSE - 004. With this purchase, UNS Electric will carry a credit surplus of 1,981 MWh of "Other" credits into 2007.

UNS Electric received approval from the Arizona Corporation in August 2004 for the GreenWatts and SunShare Programs. Since the inception of the SunShare Program, twenty-five customers have received \$230,929 in subsidies through 2006.



# Attachment 8

**UNS Electric, Inc. Uniform Credit Purchase Program**

**Full Compliance Opportunity Plan**

**Renewable Energy Credit Purchase Program**

**(RECPP)**

**Definition**

## **UNS Electric, Inc. Renewable Energy Credit Purchase Program (RECPP)**

UNS Electric, Inc. ("UNS Electric") is committed to assisting our customers develop their own renewable generation resources, through a balanced and supportive renewable energy distributed generation incentive program. Our goal is to create a program that will provide incentives for affordable, environmentally sensitive, customer-sited renewable energy generation systems to supplement UNS Electric customer's energy needs. A properly designed system, matched to a customer's energy use, will provide a reduction in utility bills through the use of renewable resources. This program reflects our commitment to reduce the cost of developing renewable energy resources in partnership with our customers and help provide our customers with clean energy options.

## Defined Terms

**ACC** – Arizona Corporation Commission.

**AZROC** – Arizona Registrar of Contractors.

**Applicant** – Utility customer of record for the Utility Revenue Meter located at the installation site; a builder of the structure (residential or non-residential) who will reserve and install the Qualifying system; or for an off-grid Qualifying System, the property owner for the installation site located within a Utility's service territory.

**Arizona Business License** – A business license issued by the ACC.

**Cancelled** – Reservation Status indicating that a Reservation has been terminated, funding is no longer allocated, and the utility has removed the reservation from the funding queue.

**Cancellation** – The termination of the Reservation.

**Commissioned** – Qualifying System certified to be in operation.

**Commissioning Package** – Written verification signed by the installer and the customer confirming that the system has been installed in conformance with the approved reservation and that the system is ready for operation.

**Conforming Project** – Any project utilizing a renewable technology listed in Attachment D.

**Conformance Inspection** – Inspection performed by the utility to verify that the system has been installed and operates in conformance with the Reservation application.

**Customer** -- Utility customer of record for the Utility Revenue Meter located at the installation site or a builder of the structure (residential or non-residential) who will reserve and install the Qualifying System.

**Extension** – The extension of the Reservation Timeframe.

**Installer** – The entity or individual responsible for the installation of a qualifying system.

**Interconnection Inspection** – Inspection performed by the utility to confirm that the system can be safely interconnected to the power grid.

**Non-Conforming Project** – Non-conforming projects include, but are not limited to, projects with staged completion dates, multi-customer or multi-system projects, projects involving more than one technology, projects requiring new or unique agreement terms, projects with technologies for which qualification standards have not been developed or projects requiring non-standard timeframes.

**Performance Based Incentive (PBI)** – Incentive based on a rate per kWh output or equivalent kWh of energy savings.

**Project Costs** – System Costs plus financing costs.

**Proof of Project Advancement** – Documentation demonstrating that a project is progressing on schedule and is staged for Commissioning on or before the end of the Reservation Timeframe.

**Qualifying System** – Distributed renewable energy systems meeting the qualifications for production of qualified Renewable Energy Credits in Arizona acceptable to the Arizona Corporation Commission as they may be defined for affected utilities to meet any renewable energy standards.

**Renewable Energy Credit (REC)** – One Renewable Energy Credit is created for each kWh, or kWh equivalent for non-generating resources, derived from an eligible renewable energy resource. RECs shall include all environmental attributes associated with the production of the eligible renewable energy resource.

**Reservation** – A dollar amount committed by the utility to fund a project if all program requirements are met.

**Reservation Status** – Indicator relating to approval or denial of a Reservation request. If a Reservation is approved, the Reservation Status is Reserved. If a Reservation request is denied, the Reservation Status is either Cancelled or Wait Listed.

**Reserved** – Status indicating the acceptance of a Reservation request.

**Reservation Timeframe** – The duration of the utility's funding commitment for a Reservation.

**System Costs** -- Costs associated with the Qualifying System components, direct energy distribution, system control/metering, and standard installation costs directly related to the installation of the Qualifying System.

**Up Front Incentive (UFI)** – One time incentive payment based on system capacity or estimated energy kWh production rather than on measured system output.

**Wait List** – Status indicating Applicant has met program requirements, but the Utility has insufficient funding to commit to funding the project.

## **UNS Electric Renewable Energy Credit Purchase Program (RECPP) Review Panel**

UNS Electric will participate in a RECPP Review Panel for ongoing review and modification of all Renewable Distributed Generation programs, as prescribed by the ACC. UNS Electric believes that the Review Panel making recommendations to expeditiously modify all UNS Electric renewable programs is critical to its ultimate success. Program elements may need to be adjusted to reflect new information, changing market conditions, incorrect initial assumptions, or technological innovations.

### **Panel Structure and Function**

The Review Panel will be a five member panel created and maintained to provide on-going review of all renewable distributed generation program modifications and to efficiently facilitate incorporation of features that increase program efficacy as more information is gained by program implementation. The panel will make recommendations to the UNS Electric Renewable Energy program management for review and potential program incorporation.

The panel make-up includes one representative from the ACC staff, two representatives from the Mohave County and/or Santa Cruz County area renewable distributed generation industry, and two representatives from UNS Electric. The industry representatives should not exceed one each from a technology type and should reflect the diversity of technologies and consumer types available in the Mohave County or Santa Cruz County areas.

No renewable distributed generation industry representative shall serve more than one four year term.

The Review Panel shall make recommendations for consideration on the following subjects:

- Adjustment of incentive structures to reflect market response
- Process related issues that affect market function
- Development of new conforming incentives, as necessary
- Arbitration of incentive or program borne conflicts

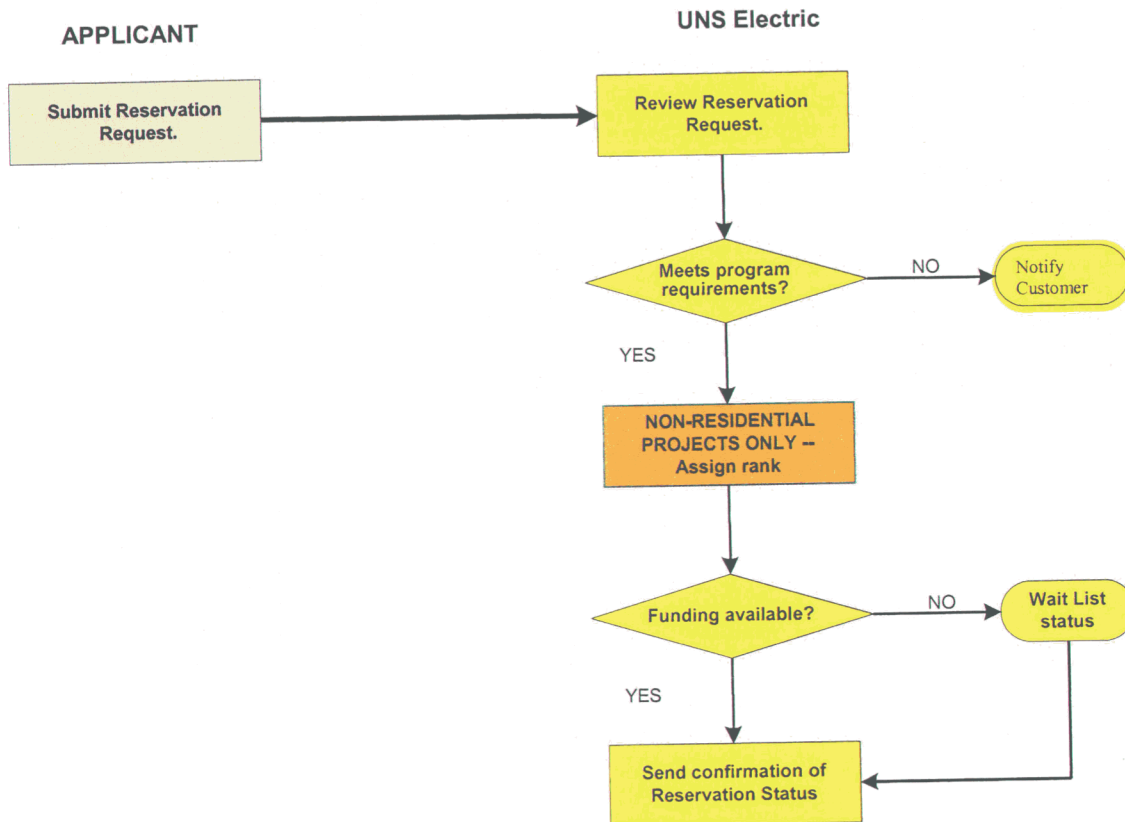
The Review Panel should meet twice per year (or more often as necessary) to assess the items related to the above-described purpose. The Review Panel will review input from stakeholders on items before it for consideration, and it is anticipated that on occasion stakeholders may be consulted by the Review Panel to provide additional input. Upon full consideration of an item, the Review Panel will vote on adoption of the specified recommendation. A super-majority majority vote of at least four affirmative votes on a subject would result in a recommendation for consideration and potential incorporation into the RECPP. UNS Electric requests Commission approval of authority to implement unanimous five affirmative vote recommendations of the Review Panel without further Commission review and approval. For conditions where a unanimous vote is not achieved, the Commission will have the final approval authority.

## Process Map – Conforming Projects

UNS Electric mapped the RECPP process for conforming projects to illustrate the flow of information between the applicant and UNS Electric. The following sections reflect the recommended process flow.

### Step 1 – Reservation Request and Assignment of Reservation Status

#### UCPP CONFORMING PROJECTS PROCESS MAP



#### Process Map Description – Step 1

The first input UNS Electric receives from the customer is the reservation request. UNS Electric will review the reservation request to ensure the application conforms to program requirements. Residential reservation requests are processed on a first-come, first-served basis. Non-residential reservation requests are assigned a rank based on the lowest expected life cycle credit purchase cost. Additional detail on non-residential reservations is provided in the incentives section of this report.

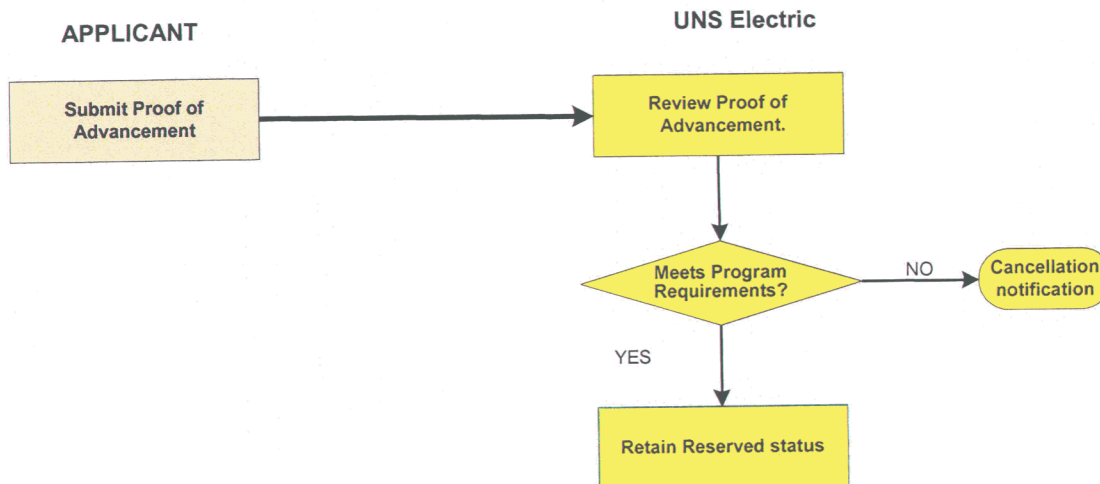
After reviewing the reservation request, UNS Electric will assign a reservation status. If the reservation request is approved, UNS Electric will send a confirmation to the applicant. If the reservation request is denied because the request is not in compliance with program requirements, UNS Electric will send notification to the applicant of the discrepancies and that the request will be cancelled. Similarly, if the



reservation request is denied because funding is not available, UNS Electric will send a notification to the applicant that the request will be placed on a waiting list.

Residential reservation requests will be reviewed within 30 days of the utility's receipt of the request. Non-residential reservation requests will be reviewed within 90 days of UNS Electric's receipt of the request. Further detail relating to reservation periods is provided under the section titled Incentive Allocation.

### Step 2 – Proof of Advancement Process Map



#### Process Map Description – Step 2

The applicant must submit proof of advancement to UNS Electric to retain his or her reservation within the timeframes outlined below. At a minimum, the Proof of Project Advancement documentation for a non-residential application greater than 20 kWac will include:

- A project agreement (between customer and installer);
- An executed installation agreement including all project participants;
- Building and/or construction permits and/or a full set of design development or construction drawings (80% or more complete); and
- An executed interconnection agreement (if applicable).

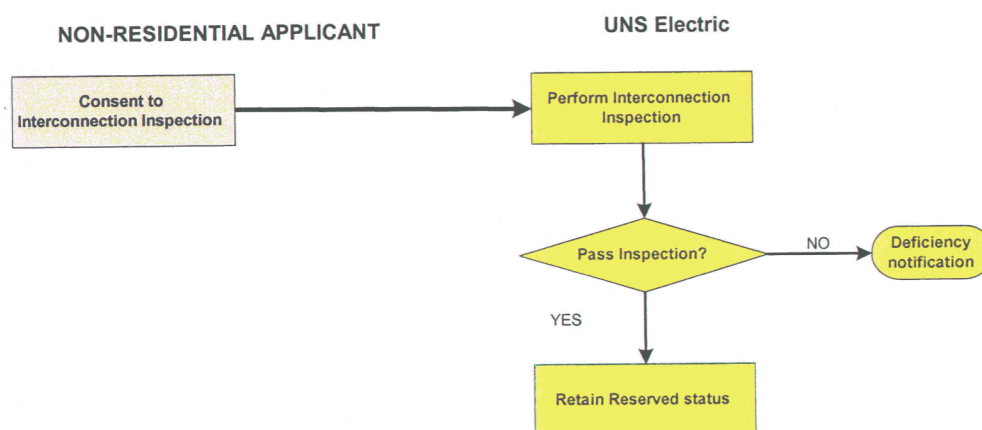
Residential customers and non-residential customers installing a renewable energy system with rated production capacity of 20 kWac or less must provide copies of City/County construction permits to UNS Electric.

The timeline for proof of project advancement is based on the date of reservation confirmation and must be provided by the customer in accordance with the following schedule:

<b>Residential</b>	<b>Non-Residential <math>\leq 20,000</math> watts AC capacity equivalent</b>	<b>Non-Residential <math>&gt; 20,000</math> watts AC capacity equivalent</b>
60 Days	60 Days	120 Days

If proof of project advancement is not received within the specified timeframe, the customer will be notified that the reservation is cancelled. The applicant has the option to reapply for funding after the reservation has been cancelled. The request will be processed in the same manner as a new project reservation and will be contingent upon availability of funding.

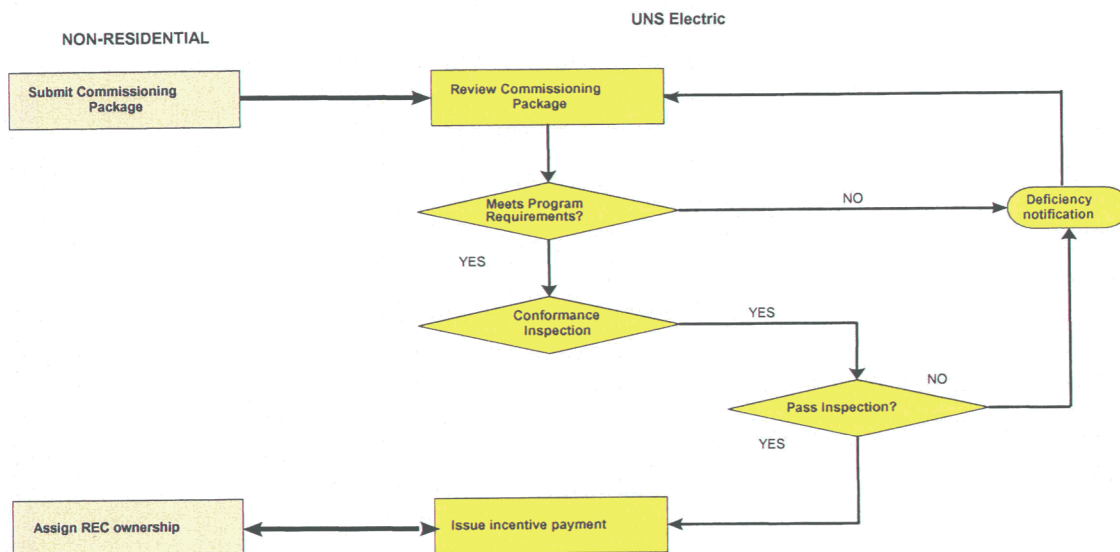
### Step 3 – Interconnection Inspection (for Grid-Tied Qualifying Systems with capacity larger than 20 kWac)



#### Process Map Description – Step 3

Non-residential grid-tied qualifying systems of electrical generating capacity larger than 20 kWac must submit to and pass an interconnection inspection before the system can be commissioned. UNS Electric conducts the interconnection inspection and will notify the applicant of the results of the inspection. If the system passes the inspection, the application retains the reservation. The applicant can keep the reservation even if the system fails the initial inspection, as long as the deficiency is remedied within the defined reservation timeframe described in Step 2.

## Step 4 – System Commissioning For Non-Residential Systems with capacity Larger Than 20 kWac



### Process Map Description for System Commissioning Non-Residential Customers – Step 4

After the Non-Residential system has been commissioned, the applicant must submit a commissioning package to UNS Electric. UNS Electric will review the commissioning package and confirm that all program requirements have been met, including passing the interconnection inspection. For systems with capacity larger than 20 kWac, UNS Electric may, at its discretion, perform a conformance inspection of the system. UNS Electric will notify the applicant of the scheduled conformance inspection and the applicant must make the system available for inspection. In some cases, an incentive payment may not be issued until after a qualifying system has passed the conformance inspection.

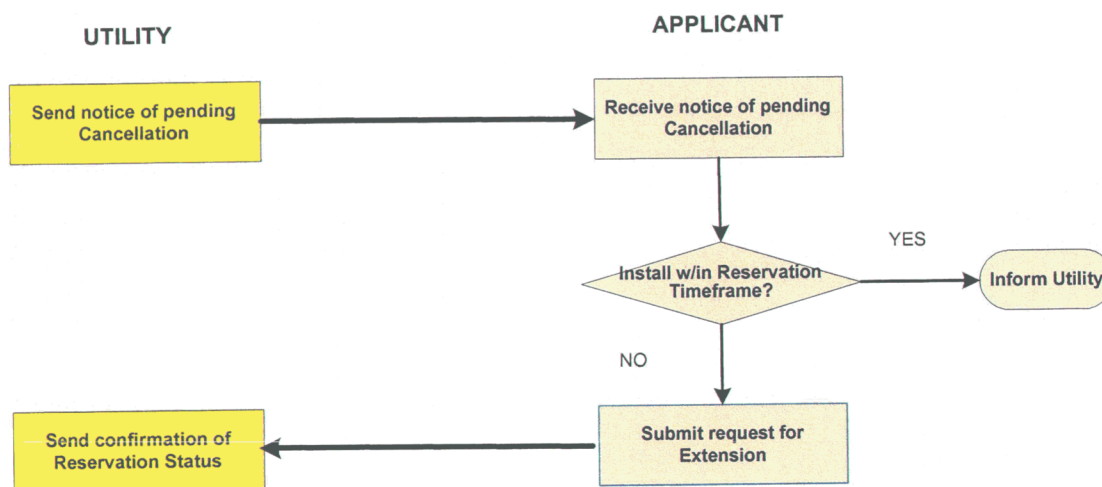
Residential customers and non-residential customers with systems of capacity 20 kWac and less will notify UNS Electric that their installation is complete. UNS Electric will perform an acceptance test to verify installation and system performance after receiving copies of City/County permit.

Residential customers and non-residential customers with systems of capacity 20 kWac and less, who are receiving a UFI payment, and have met all program requirements, will receive the incentive payment within thirty days of successful acceptance. After UNS Electric issues the UFI payment to the applicant, UNS Electric is assigned exclusive rights to all the RECs associated with the generation produced from the qualifying system for a period of at least twenty years.



Systems receiving PBI payments will report production, receive payment, and release all RECs in conformance with the detail described in this report under the sections titled *Procedures for Production Based Incentives and Distributed Generation Incentives*.

### Conditionally Required Step - Cancellations



### Process Map Description – Cancellations

Unless an extension is granted, as described below, a reservation request will be cancelled if all program requirements have not been met with the reservation timeframe.

The reservation timeframe is determined in accordance with the following schedule:

<b>Residential</b>	<b>Non-Residential <math>\leq</math> 20,000 watts ac capacity equivalent</b>	<b>Non-Residential &gt; 20,000 watts ac capacity equivalent</b>
180 Days from Reservation Confirmation Date	180 Days from Reservation Confirmation Date	365 Days from Reservation Confirmation Date

UNS Electric will notify the applicant of the pending cancellation in accordance with the following schedule:

<b>Residential</b>	<b>Non-Residential <math>\leq</math> 20,000 watts ac capacity equivalent</b>	<b>Non-Residential &gt; 20,000 watts ac capacity equivalent</b>
30 Days Prior to Cancellation	30 Days Prior to Cancellation	60 Days Prior to Cancellation

### Extensions

UNS Electric will grant an extension for up to 90 days following timely receipt of a customer's request for extension. UNS Electric may approve written extension requests detailing the conditions for delay for periods beyond 90 days under extenuating circumstances.

## **Operations Monitoring**

All customers receiving renewable energy self-generation incentives are obligated to report system production to UNS Electric in accordance with the reporting schedule established in the program agreement between UNS Electric and the customer. UNS Electric, at its option, may perform periodic inspection of the system for operation, metered production, and reporting purposes.

## **Procedures for Production Based Incentives**

Each project eligible for a PBI requires a project agreement between the applicant(s) and UNS Electric that will detail the assignment of energy and RECs and the assignment of payment. All PBI Project Agreements will include the following requirements:

1. Meters certified according to the UNS Electric standards that provide readings in kWh will be provided by UNS Electric as part of the system commissioning package.
2. Quarterly meter reads will be performed by UNS Electric and quarterly payments will be made to the assigned payee within 30 days, based on quarterly kWh production. If the payment due is less than \$25.00, it will be held for the next payment period.
3. PBI payments will begin with the first quarterly production following receipt of the completed system commissioning package and commissioning test, if required, and continue for the life of the agreement term. As part of this provision, it is understood that systems commissioned mid-quarter will receive payment only for the production of that partial quarter.

## **Installer Qualifications**

All systems receiving incentives under the RECPP must be installed by a qualified installer. The following requirements must be submitted by the applicant as part of the reservation request. UNS Electric will verify that the installer meets the following minimum qualifications prior to confirming a reservation request:

1. The installer must possess a valid license on file with the AZROC with a license classification appropriate for the technology being installed or the installer must identify use of a contractor holding an appropriate license on file with the AZROC for the technology being installed. A copy of the AZROC license must be provided as part of the reservation request.
2. The installer must possess an Arizona business license that is active and in good standing.

Installers may request that the above information be retained on file with UNS Electric; however, under this option the installer must certify that the information on file remains current with the submission of each reservation request. Information on file must be renewed yearly.

## **Installations By Customer (Residential Photovoltaic and Wind Only)**

Residential customers may self-install photovoltaic and wind generators of capacity not to exceed 10 kWac providing they adhere to all applicable codes and standards. The customer installed systems are eligible for an incentive equal to 70% of the standard UFI, as otherwise listed in the incentive table,

Attachment D. UNS Electric reserves the right to withdraw this self-install qualification condition at any time in the future, if UNS Electric finds self-installations are not adhering to the applicable codes and standards or are found to be of poor quality workmanship.

### **Energy Reporting**

UNS Electric will report on the productivity of all RECPP distributed renewable energy resource systems within the format of the annual renewable energy Compliance Report to the ACC. For PBI systems, UNS Electric will report on the actual metered production of each system as reported by the customer and confirmed by UNS Electric. For systems receiving a UFI, UNS Electric will report on the total installed capacity and metered production.

### **System Removal**

If receiving a UFI, customer shall not remove the Qualifying System or any components thereof from the premises until December 31<sup>st</sup> of the 20<sup>th</sup> full calendar year following completion of system installation of the renewable energy system, without express agreement of UNS Electric. If receiving a PBI, customer shall not remove the Qualifying System or any components thereof from the premises until the last day of the final month of the final full calendar year of the applicable incentive payment term in the Agreement following completion of system installation of the renewable energy system, without express agreement from UNS Electric. If customer removes the Qualifying System in violation of this provision, customer shall immediately reimburse UNS Electric all incentive amounts paid by UNS Electric to customer or on behalf of customer to an authorized third party.

In addition, if a Qualified System is removed, UNS Electric shall monitor that specific customer site to ensure that an additional incentive is not provided for any new distributed renewable energy resource system on that site until the REC contracted operational life of the original system has been completed.

UNS Electric shall attempt to monitor the number of missing or non-working distributed generation systems and shall summarize its observations in its annual Compliance Report.

### **Qualifying Distributed Renewable Energy Resource Technologies – Technology Criteria**

The following technology criteria are not intended to preclude the participation of any renewable energy technology approved for implementation under the RECPP. These criteria are aimed at detailing those technologies or application segments within a technology which have been reviewed in detail by UNS Electric and were accepted as eligible conforming projects for the RECPP. In addition, the following sections provide detail on those criteria required by participating technologies.

#### General Criteria

UNS Electric acknowledges that many regulations and site specific requirements may apply to the installation of any one renewable energy technology. UNS Electric agrees that no requirement imposed by these technology criteria shall be imposed in conflict with any other governmental requirements. Any RECPP based requirement which is in conflict with a site specific governmental requirement shall be

detailed in the reservation request. All qualifying systems must adhere to the following requirements in addition to the RECPP program requirements:

- The project must comply with applicable local, state, and federal regulations.
- Products must be installed according to manufacturers' recommendations.
- Installations must meet applicable governmental statutes, codes, ordinances, and accepted engineering and installation practices.
- Systems must be permitted and inspected by the jurisdiction having authority over construction projects in the customer's locale.
- All major system components must be new and must not have been previously placed in service in any other location or for any other application.
- All renewable electricity generation systems must include a dedicated performance meter (provided by UNS Electric) which allows for measurement of system energy production. Certain other non-electric renewable energy production systems, noted below, will require customer supplied metering for PBI payment calculation purposes.
- If the qualifying system is grid-tied, the system must meet Arizona Corporation Commission Interconnection Requirements for Self-Generation Equipment.

#### Referenced standards

Some technology-specific criteria reference third party standards. The requirements of those standards are fully applicable when referenced as part of technology specific criteria. UNS Electric notes that rapid growth in national and international renewable energy programs is resulting in greater need for the development of standardization in such areas as; design, implementation, performance measurement, system integrity, and installation. UNS Electric recognizes that new standards are likely to develop in the near future for technologies included in the RECPP and recommends that the new standards are examined for application in this program definition as they become available. The following standards or standard development bodies are referenced as part of the recommended technology criteria:

- The Active Solar Heating Systems Design Manual developed by the American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) in cooperation with the Solar Energy Industries Association (SEIA) and the ACES Research and Management Foundation (the Design Manual).
- Arizona State Boiler Regulations (see R4-13-406).
- The select technology specific qualification developed by the California Energy Commission (CEC).
- Solar Rating and Certification Corporation (SRCC). The SRCC criteria and ratings can be viewed at [www.solar-rating.org](http://www.solar-rating.org).
- The Underwriters Laboratory (UL).
- IEEE -929 standard for utility interconnection of PV systems

## Technology Specific Criteria

The following equipment qualifications listed are mandatory requirements which must be met at the time of project commissioning to receive a RECPP incentive. The installation guidance is intended to provide consumers with information on installation and operation practices which are most likely to support achieving the system's designed output. Installation guidance is mandated in order for a project to receive a RECPP incentive, as it does reflect both industry and UNS Electric concurrence on those practices which are important for a technology to best achieve the designed output. In the future, additional installation guidance items may be considered for inclusion as part of the equipment qualifications.

### **Biomass/Biogas, Hydro or Geothermal Electric**

#### Equipment Qualifications

- Biomass/Biogas, Hydro or Geothermal system installations involving a regulated boiler or pressure vessel are required to comply with all Arizona state boiler regulations; provide a qualifying boiler inspection identification number; and keep all applicable permits in good standing.
- System must include a dedicated performance meter to allow for monitoring of the amount of electricity produced.
- Pre-operational/or pre-commissioning energy savings and design output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a qualified registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
- The system will have a material and labor warranty of at least five years.
- The system must meet Arizona DEQ environmental standards.

#### Installation Guidance

Because of the individual nature of biomass/biogas hydro or geothermal systems, care should be taken to make sure the system complies with all applicable permitting and regulatory requirements including, but not limited to, air emission standards and air permit regulations.

### **Biomass/Biogas or Geothermal Space Heating, Process Heating or Space Cooling**

#### Equipment Qualifications

- Biomass/Biogas or geothermal system installations involving a regulated boiler or pressure vessel are required to comply with all Arizona state boiler regulations; provide a qualifying boiler inspection identification number; and keep all applicable permits in good standing.
- Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer. The engineering



report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.

- System must include a dedicated performance meter to allow for monitoring of the amount of useful cooling produced. As an exception to the REST Rule R14-2-1803.B, energy production will be calculated at one kW-hr per ton of metered cooling for systems with capacity of 100 tons or less and one kW-hr per 1.33 tons for systems with a capacity of greater than 100 tons.
- Energy production for space heating and process heating will be calculated as one kWh of energy per 3,415 Btu of useful heat delivered by the system and used by the building space or process.
- The system will have a material and labor warranty of at least five years.
- The system must meet Arizona DEQ environmental standards.

#### Installation Guidance

Because of the individual nature of biomass/biogas or geothermal systems, care should be taken to make sure the system complies with all applicable permitting and regulatory requirements including, but not limited to air emission standards and air permit regulations.

#### **Solar Non-residential Daylighting**

##### Equipment Qualifications

All systems shall include the following components as part of the daylighting system:

- A roof mounted skylight assembly with a dome having a minimum 70% solar transmittance.
- A reflective light well to the interior ceiling or a minimum 12" below roof deck in open bay areas.
- An interior diffusion lens.
- A minimum of one thermal break/dead air space in the system between the skylight dome and the interior diffuser.
- If artificial lighting systems remain a part of the installation, the system shall include automated lighting control(s) which are programmed to keep electric lights off during daylight hours of sufficient solar insolation to provide minimum design illumination levels.
- The system must provide a minimum of 70% of the light output of the artificial lighting system which would otherwise be used for all of the claimed period of energy savings as measured in foot-candles in the workspace 36 inches above the floor.
- Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer or accredited AEE Measurement and Verification professional. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
- The system will have a material and labor warranty of at least five years.

### Installation Guidance

All systems should be installed such that the skylight dome is substantially unshaded and have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.

### **Small Wind Generator**

A small wind generator is a system with a nameplate capacity rating of one MW or less. The technology criteria described below are intended for small wind generators with a nameplate rating of 100 kW or less. Larger systems will be required to submit a detailed package describing site selection, energy production modeling, and an engineered system design and installation report.

### Equipment Qualifications

- Eligible small wind systems must be certified and nameplate rated by the CEC<sup>1</sup>. See [www.consumerenergycenter.org/erprebate/equipment.html](http://www.consumerenergycenter.org/erprebate/equipment.html) for a list of certified generators. For grid tied or off-grid wind generators where an inverter is used, the CEC listed nameplate rating of the wind generator will be multiplied by the CEC approved weighted efficiency percentage listed for the inverter in the "List of Eligible Inverters" at [www.consumerenergycenter.org/cgi-bin/eligible\\_inverters.cgi](http://www.consumerenergycenter.org/cgi-bin/eligible_inverters.cgi) to calculate the wind turbine nameplate rating for use in determining the UFI payment.
- Grid connected inverters used as part of the system shall carry a UL listing certifying full compliance with Underwriter's Laboratory ("UL")-1741
- A system must include a dedicated performance meter (provided by UNS Electric) installed to allow for measurement of the amount of electricity produced.
- The performance meter and utility disconnect for grid tied systems will be installed in a location readily accessible by UNS Electric during normal business hours.
- Off-grid systems of capacity less than 10 kWac will not be metered. Compliance reporting production will be based on an annual 20% capacity factor.
- The tower used in the installation must be designed by an Arizona registered engineer and must be suitable for use with the wind generator. Tower installation must be designed and supervised by individuals familiar with local geotechnical conditions.
- To receive a UFI, the wind generator and system must be covered by a manufacturer's warranty of at least ten years. Otherwise the system will qualify for a PBI. In all cases the wind system will have a material and labor warrantee of at least five years.

### Installation Guidance

- Location: a wind turbine hub should be at least 20 feet above any surrounding object and at least 28 feet above the ground within a 250-foot radius. Wind generators should be installed in locations with an elevation at or above the general elevation of the surrounding terrain.

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<sup>1</sup> UNS Electric recommends review of the SWCC standards for rating small wind generators once they become available for purposes of supplanting the CEC requirement in this Technology Criterion.

- Lot Size: should be one-half acre at minimum. Municipalities and public facilities such as schools and libraries are exempt from the minimum lot size requirements.
- The proposed system for which application is made should be demonstrated by support information to obtain at least a 15% annual capacity factor. The following are readily available methods for helping to demonstrate the potential for a 15% capacity factor, but other methods may be used. The installation location should have a demonstrated average annual wind speed of at least 10 MPH as measured at a height of no more than 50 feet above the ground. Average annual wind speed can be demonstrated by wind speed records from an airport, weather station, or university within 20 miles of the proposed wind generator location, or by a 50 meter wind power density classification of Class 2 "Marginal" or higher on the State of Arizona Average Annual Wind Resource Map dated July 16, 2005, or later as published by Sustainable Energy Solutions of Northern Arizona University. Northern Arizona University provides detailed wind resource maps as well as other resource services. For more information contact Northern Arizona University at <http://wind.nau.edu/maps/>.

## **Photovoltaic Systems**

### Equipment Qualifications

#### *All Systems*

- All systems shall be installed with a horizontal tilt angle between 10 degrees and 60 degrees, and an azimuth angle of +/- 100 degrees of due south. Installation configurations for some systems receiving a UFI will not be eligible for the full RECPP incentive. The reduction will be determined by the UNS Electric developed de-rating chart, Attachment B of this document, and as discussed further in this report under the section titled Conforming Project Incentives.
- A system must include a dedicated performance meter (on grid tied systems, supplied by UNS Electric) to allow for monitoring of the amount of electricity produced.
- Qualifying systems using Building Integrated Photovoltaic (BIPV) modules of total array capacity of 5 kWdc or less shall receive 90% of the UFI incentive value for PV systems listed in Attachment A. Systems using BIPV module of total array capacity of greater than 5 kWDC shall only receive a PBI.
- Photovoltaic modules must be covered by a manufacturer's warranty of at least 20 years.
- Inverters must be covered by a manufacturer's warranty of at least ten years to receive a UFI and at least five years to receive a PBI.

#### *Grid-Connected Systems*

- The minimum PV array size shall be no less than 1,200 Wdc
- All photovoltaic modules must be certified by a nationally recognized testing laboratory as meeting the requirements of UL Standard 1703.
- All other electrical components must be UL listed.

- The inverter must be certified as meeting the requirements of IEEE-1547 - Recommended Practice for Utility Interface of Photovoltaic Systems and it must be UL 1741 certified.
- The utility meter, inverter, and utility disconnect will be installed in a location readily accessible by UNS Electric during normal business hours.
- Systems shall meet the requirements of Attachment A or Attachment C as appropriate.

#### *Off-Grid Systems*

- The minimum PV array size shall be no less than 600 Wdc and the maximum PV array size shall not exceed 2,000 Wdc.
- All photovoltaic modules must be certified by a nationally recognized testing laboratory as meeting the requirements of UL 1703.
- Off-grid systems will not be metered. Compliance reporting production will be based on an annual 20% capacity factor using nameplate DC rating for capacity.
- All other electrical components must be UL listed.

#### Installation Guidance

The Customer will be directed to the following resources to gain information regarding industry reference documents for system installation and performance forecasting:

The California Energy Commission's Guide to Buying a Photovoltaic Solar Electric System at [http://energy.ca.gov/reports/2003-03-11\\_500-03-014F.PDF](http://energy.ca.gov/reports/2003-03-11_500-03-014F.PDF)

The Arizona Consumers Guide to Buying a Solar Electric System at [www.azsolarcenter.com/design/azguide-1.pdf](http://www.azsolarcenter.com/design/azguide-1.pdf)

#### **Solar Space Cooling**

##### Equipment Qualifications

- The minimum cooling capacity of the system will be 120,000 BTU (10 tons) per hour.
- Solar collector panels used will have a Solar Rating and Certification Corporation ("SRCC") OG-100 rating or laboratory documentation showing the panel energy output under controlled and replicable test conditions.
- Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
- System must include a dedicated performance meter to allow for monitoring of the amount of useful cooling produced. As an exception to the REST Rule R14-2-1803.B, energy production

will be calculated at one kW-hr per ton of metered cooling for systems with capacity of 100 tons or less and one kW-hr per 1.33 tons for systems with a capacity of greater than 100 tons.

- The system will have a material and labor warranty of at least five years.

#### Installation Guidance

- The horizontal tilt angle of the collector panels should be between 20 and 60 degrees and an azimuth angle should be between +/- 45 degrees of south.
- All systems should be installed such that the energy collection system is substantially unshaded and should have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.
- The system installation should comply with the design manual.

### **Non-residential Solar Water Heating and Space Heating**

#### Equipment Qualifications

- Solar collector panels used will have a SRCC OG-100 certification or laboratory documentation showing the panel energy output under controlled and replicable test conditions.
- If annual energy production is expected to exceed 10,000 kWh or equivalent, the system must include a dedicated performance customer supplied meter to allow for monitoring of the amount of useful heat produced. Otherwise, compliance reporting production will be based on the design energy savings submitted at time of application.
- Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
- The solar collector, heat exchangers and storage elements shall have an equipment warranty of at least 10 years to qualify for a UFI and at least five years to qualify for a PBI
- The system will in all cases have a material and full labor warranty of at least five years.

#### Installation Guidance

- The horizontal tilt angle of the collector panels should be between 20 and 60 degrees (30 and 60 degrees for space heating applications) and an azimuth angle +/- 45 degrees of south.
- All systems should be installed such that the energy collection system is substantially unshaded and should have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.
- The system installation should comply with the design manual.

## Small Domestic Solar Water Heating and Space Heating

### Equipment Qualifications

- Domestic Solar Water Heating systems will be rated by the SRCC and meet the OG-300 system standard. Systems that include OG-100 collectors, but are not certified under OG-300, will need to be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer detailing annual energy savings. Solar Space Heating systems will utilize OG-100 collectors.
- Domestic Water Heating systems shall be selected and sized according to the geographic location and hot water needs of the specific application. Reservation requests will include a manufacturer's verification disclosing that the system size and collector type proposed is appropriate for the specific application, including certification that collector stagnation temperature shall never exceed 300 degrees Fahrenheit under any possible conditions at the location of the installation. The manufacturer's verification may be presented as a manufacturer's product specification sheet and will be included in the reservation request. Compliance reporting production will be based on the design energy savings submitted at time of application
- Solar Space Heating systems will be sized in conformance with the Solar Space Heating Incentive Calculation Procedure (Attachment E.) Compliance reporting production will be based on the design energy savings submitted at time of application
- Active, open-loop systems are not eligible for RECPP incentives except for active, open-loop systems that have a proven technology or design that limits scaling and internal corrosion of system piping, and includes appropriate automatic methods for freeze protection and prevents stagnations temperatures that exceed 250 degrees F. under all conditions at the location of installation. Details disclosing conformance with this exception shall be submitted as part of the manufacturer's verification documentation.
- Integrated Collector System (ICS) systems shall have a minimum collector piping wall thickness of 0.058 inches. Details disclosing conformance with this requirement shall be submitted as part of the manufacturer's verification documentation. ICS units shall include certification that collector stagnation temperature shall never exceed 250 degrees F. under any possible conditions at the location of the installation.
- The 'high' limit on all Domestic Water Heating controllers shall be set no higher than 160 degrees F.
- Active thermal storage for solar space heating systems shall use water as the storage element.
- Contractors must provide a minimum of a five year equipment warranty as provided by the system manufacturer, including a minimum warranty period of five years for repair/replacement service to the customer.
- Domestic Water Heating systems that are installed as an addition to an existing system or are submitted as a customer designed system or not certified to OG-300 must be specifically reviewed and approved by the utility.
- The solar collector, heat exchangers and storage elements shall have an equipment warranty of at least 10 years to qualify for a UFI and at least five years to qualify for a PBI.

### Installation Guidance

- The system shall be installed with a horizontal tilt angle between 20 degrees and 60 degrees (40 and 60 degrees for space heating applications), and an azimuth angle of +/- 60 degrees of due south (+/- 20 degrees for space heating applications). It is recommended that collectors be positioned for optimum winter heating conditions at a minimum tilt angle of 45 degrees above horizontal, or as recommended by the manufacturer for the specific collector type and geographic location of installation.
- All systems should be installed such that the energy collection system is substantially unshaded and should have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.
- Heat exchange fluid in glycol systems should be tested, flushed and refilled with new fluid as necessary or at a minimum every five years or sooner per manufacturer's recommendations.
- It is recommended that the anode rod be checked and replaced per manufacturer's recommendations, but no less frequently than every five years.
- It is recommended that the system design include a timer, switch, or other control device on the backup element of the storage tank.
- The collectors and storage tank should be in close proximity to the backup system and house distribution system to avoid excessive pressure or temperature losses.
- It is recommended that in areas where water quality problems are reported to have reduced the expected life of a solar water heater, that a water quality test is performed for each residence to screen for materials that through interaction with the materials of the proposed solar water heating system may reduce the expected operational life of the system components. The customer should consider contacting the manufacturer to determine if warranty or operational life will be affected.
- In areas subject to snow accumulation, sufficient clearance will be provided to allow a 12" snowfall to be shed from a solar collector without shadowing any part of the collector.
- Each system shall have a comprehensive operation and maintenance manual at the customer's site, which includes a spare parts list, data sheets and flow diagrams indicating operating temperatures and pressures, maintenance schedules and description of testing methods and each customer must complete an initial start up and operation training review with the contractor at the time of system start up.
- Ball valves shall be used throughout the system. Gate valves shall not be used.
- Pipes carrying heated fluids shall be insulated for thermal energy conservation as well as personnel protection.

### **Technologies without Technology Specific Criteria and Non-Conforming Projects**

Technology specific criteria have not yet been developed for the following qualifying technologies:

- Fuel Cells
- Non-Residential Pool Heating

For applicants requesting incentives for the above technologies or for applicants requesting installation of a technology with conforming project technology criteria, but where some criteria cannot be met, the applicant will need to submit design and output documentation.

Applicants installing these systems will, at a minimum, need to provide an energy savings and designed output report for the system. The report must include either a testing certification for a substantially similar system prepared by a publicly funded laboratory or an engineering report stamped by a qualified registered professional engineer. The engineering report and/or testing certification shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications. Additional information may be required as part of the RECPP requirements.

### **Distributed Renewable Energy Resource Incentives**

#### Incentive Principles

RECPP incentives can be applied to systems designed to serve only the typical load of the customer with whom the incentive agreement has been established. The assessment of that typical load does not preclude the periodic production of electricity in excess of the customer's demand. Under some circumstances it is understood that select customer installations will be designed to serve loads greater than that of the customer. Under those circumstances, the RECPP incentive will be applied only to the fraction of the generation which is used to serve the typical customer load. Other incentives were developed separate and apart from other RECPP program incentives, such as those for demand side management projects. Systems are not eligible to receive RECPP incentives if other utility incentives are applied.

Up-front incentives (UFIs) are those incentives where the customer receives a one-time payment based on the system's designed capacity or based on the first year energy savings provided by the system. In general, this type of incentive is appropriate for smaller, 20 kWac or less, non-residential installations and all residential installations. The second incentive type is a production based incentive (PBI). The PBI allows the customer to collect incentive payments in direct relation to the actual system production. PBIs are most appropriate where the total system costs are large, of 20 kWac capacity or above.

Incentive funds can be applied to a project, which is the sum of all systems installed at a customer site in a single calendar year. A customer site is the sum of facilities and/or buildings associated with a single utility revenue meter.

A customer site can obtain a UFI for multiple projects, under separate reservations, up to 20,000 Wac capacity equivalent at each customer site. Once the sum of incentives for all project(s) exceeds the 20,000 Wac capacity equivalent limit, described below, incentives for additional projects will take the form of a PBI. This condition only applies to non-residential systems. No partial or split payment types are allowed under one project regarding a UFI or PBI.

All residential systems will be offered only a UFI, unless system warranty conditions will not qualify for a UFI in which case a PBI would apply. Residential customers will receive a UFI up to a cap of 20kWac. If a residential system is installed above 20 kWac, UNS Electric will only provide an incentive payment



for the first 20 kWac. Non-residential systems may receive either a UFI or a PBI, depending on the warranty period, technology and the installation size. UFIs were developed for technologies where the average project size results in a total single site renewable capacity equivalent installed less than or equal to 20,000 watts AC. PBIs were developed for technologies where the average project size results in a total single site installed capacity equivalent of more than 20,000 Wac. Both UFIs and PBIs were developed for technologies where projects can range in size. There is no incentive cap for non-residential systems other than annual program funding considerations.

In return for UNS Electric's payment of a UFI, UNS Electric will be given complete and irrevocable ownership of the RECs until December 31<sup>st</sup> of the 20<sup>th</sup> full calendar year after completion of installation of the system. Operational life during that time frame must be supported by system warranty or planned maintenance schedules.

UNS Electric's payment of a PBI will assure UNS Electric complete and irrevocable ownership of the REC for the full duration of the PBI agreement. The agreement duration must fully coincide with the PBI payment schedule and the system must be supported by system warranty or planned maintenance schedules for the term of the agreement.

Projects receiving a UFI can receive no more than 60% of the system cost in the total incentive payout. A PBI can not exceed 60% of the real project costs, defined as the undiscounted total system cost plus acceptable financing charges. Acceptable finance charges are finance charges used for the PBI incentive cap calculation and can not exceed the current prime interest rate plus 5%. Financing charges must be disclosed as part of the commissioning package, if not disclosed before.

It is expected that the UFI and PBI incentive caps as a percentage of system cost will decline in the third year of the program to 55%, and the caps will decline to 50% in the fifth year and beyond.

RECPP incentives in combination with other state and federal incentives make it likely that some renewable energy production systems would be free to the customer, or in the extreme, that the customer would realize a net profit from installing a system.

To prevent this result, UNS Electric requires that customers requesting incentives for these systems be required to contribute a minimum of 15 percent of the System Cost in the case of a UFI and of the Project Cost in the case of a PBI. As such, the incentive for all RECPP projects will be calculated as follows: assume the full application of all available incentives, not including the RECPP incentive, and regardless of the customer's ability to fully realize any particular incentive, add the customer contribution (15%), and finally add the RECPP incentive. If the RECPP incentive can be fully applied given the other incentive cap provisions without exceeding the System Cost in the case of a UFI or Project Cost in the case of a PBI, the customer will receive the full incentive amount. If the RECPP incentive cannot be fully applied without exceeding the System Cost in the case of a UFI or Project Cost in the case of a PBI, the RECPP incentive will be capped such as not to exceed the System Cost in the case of a UFI or the Project Cost in the case of a PBI. The incentive amount will be calculated at the time the application is approved for reservation. If federal or state incentives change during the period of time after the reservation approval, the incentive amount reserved will not be changed as long as the reservation is not cancelled.

### Conforming Project Incentives

Conforming project incentives were developed to help create or expand incipient markets for distributed renewable energy production facilities, taking into account each technology's specific market conditions, and placing a significant portion of the cost on project owners. The incentives reflect specific input from each technology representative(s). Program incentives were generally not developed with specific consideration for other available state or federal incentives. Incentive caps detailed above were relied upon to account for the impact of multiple incentive sources.

In general, PBI incentive levels were developed first by establishing an incentive for a 10-year agreement. The incentives proposed by UNS Electric are detailed in Attachment D. UNS Electric proposes that the incentive matrix in Attachment D be applied for the first five years of the RECPP. In all cases, incentive values listed in Attachment D are maximum values. Applicants are encouraged to submit applications requesting incentive amounts less than the maximums listed. Applications requesting a lower level of incentive payment than the maximum will have an increased chance of acceptance in the allocation ranking process.

UNS Electric proposes that incentive types should transition to all PBI based incentives after 2012 and incentive levels should continue to decline in future program years. In the long term, incentives should be market based. UNS Electric also recommends that the declining incentives and proposed reductions be carefully reviewed prior to implementation.

### Technologies with Special Incentive Considerations

Beyond the requirements of the technology specific criteria and the requirements of the incentive matrix, some technologies require additional project specific adjustment of the available incentives. Those specific requirements are detailed below.

#### **Photovoltaic Systems**

The productivity of photovoltaic systems is sensitive to the specifics of the installation method and location. In particular, these systems are impacted by shading, photovoltaic panel horizontal tilt angle and azimuth, and potentially regional conditions. These factors are particularly important as they relate to systems receiving UFI type incentives both in the amount of incentive received by the customer and in the computation of the capacity reported by UNS Electric.

UNS Electric has established a single incentive adjustment table clearly detailing adjustments for each allowable photovoltaic system configuration. UNS Electric will work to assure that the adjustment table is easily interpreted by consumers and installers. The incentive adjustment chart prepared by UNS Electric is included as Attachment B.

#### **Small Domestic Solar Hot Water and Space Heating Systems**

Accurately predicting appropriate incentive levels in support of system costs associated with small domestic solar hot water and space heating systems present a challenge. RECPP incentives in

combination with other state and federal incentives make it likely that some systems would be free to the customer, or in the extreme, that the customer would realize a net profit from installing a system.

To prevent this result, UNS Electric proposes that customers requesting incentives for these systems be required to contribute a minimum of 15 percent of the system cost. As such, the incentive for small domestic solar hot water and space heating systems will be calculated as follows: assume the full application of all available incentives, not including the RECPP incentive, and regardless of the customer's ability to fully realize any particular incentive, add the customer contribution (15%), and finally add the RECPP incentive. If the RECPP incentive can be fully applied without exceeding the System Cost, the customer will receive the full incentive amount. If the RECPP incentive cannot be fully applied without exceeding the System Cost, the RECPP incentive will be capped such as not to exceed the System Cost.

Example:

$$\text{RECPP Incentive} \leq (\text{System Cost}) - (\text{Total of all Incentives})$$

Where:

$$\text{Total of all Incentives} = \text{Federal Incentives} + \text{State Incentives} + (15\% \text{ Customer Contribution})$$

For purpose of UFI calculation, System Cost for a solar space heating system will not include the cost of any passive thermal storage or the cost of the building heating system itself. It will include the cost of new materials and installation of active thermal storage, expansion tanks, controls, tempering valves, piping, vents, drains, safety valves and all freeze protection.

### **Small Solar Space Heating System**

There are several additional challenges associated with Solar Space Heating Systems. Variability in design for these systems generally suggested a high level of expertise was required to appropriately size and design the systems; yet the overall system cost seemed to require a standardized approach. In order to address this challenge, UNS Electric has adopted a standardized calculation method to support system sizing and incentive payment. The display page of the spreadsheet calculation is presented in Attachment E.

The solar space heating incentive calculation does not suggest or imply that a full energy audit is required to qualify for the solar space heating incentive. The intent is that industry professionals can utilize the calculation tool to aid in facilitating sound system design.

The effective use of the solar space heating incentive calculation is contingent on a Building Design Review. The Building Design Review calculations, inputs and outputs will be determined and specified as part of the reservation request. It is noted that stakeholder acceptance of the proposed calculation tool is conditioned on the future development of standardized design tools, potentially including input tables and charts.

UNS Electric believes that the proposed approach reflects sound design principles and uses inputs which should be available to professionals in this industry segment. UNS Electric does, however, recognize that the approach used in the standardized calculation is not currently universally applied. UNS Electric proposes that continuing efforts be made to develop standard input charts and tables to increase the efficiency of the method's application. In addition, it is the expectation of UNS Electric that the standard calculation can, in most instances, be implemented by practitioners in the solar space heating industry. UNS Electric supports industry collaborative efforts to increase technical knowledge development in this specific area.

### **RECPP Incentive Allocation**

UNS Electric identified two primary program level allocations in conjunction with the RECPP. The first allocation is that associated with RECPP conforming projects. The second is that associated with RECPP non-conforming Projects.

#### Conforming Project Incentive Allocation

Beyond the allocation made by UNS Electric for purposes of funding conforming projects, UNS Electric also recommends an allocation framework within the conforming project allocation. UNS Electric designed the allocation framework with several key considerations in mind. The factors considered in developing project incentive allocations were as follows:

- Administrative ease
- Economic efficiency
- Consumer clarity and ease of understanding
- Establishment of a high degree of market certainty
- Encouragement of cost reductions in renewable energy technologies
- Flexibility sufficient to allow timely adaptations to changing market conditions
- Capability for making funds available in a timely manner, and
- Avoidance of excessive incentives

These considerations resulted in two different allocation frameworks, one for residential projects and one for non-residential projects. The allocation frameworks are described below.

#### Conforming Projects – Residential Incentive Allocation – 95% of Distributed Generation funds in 2008.

Funds for conforming residential projects will be divided into four quarters (Jan-Mar, Apr-Jun, Jul-Sep, and Oct-Dec). Funds within each quarter will be made available weekly for reservations on a first-come, first-reserved basis. However, applications received during a given week that request incentive funding levels below the maximum incentive values will receive priority for the allocation of funds available that week based on the lowest expected life cycle credit purchase cost as provided in the application and verified by UNS Electric. Reservation requests can be made throughout each quarter and will be

reviewed and approved by the utility weekly as long as the quarterly funding has not been exhausted, assuming all other program requirements have been met.

Funds unused in one quarter will be equally divided among the remaining quarters in that year. Funds allocated to residential projects will not roll forward from one year to the next. If funds in one quarter are fully exhausted, funds for the following quarter will be made available at the start of the following quarter.

Reservations which are rejected as a result of insufficient funds will be offered the opportunity to retain their original reservation date for one additional quarter without the need to resubmit application documentation. If the incentive level has changed from the date of the original reservation to the date when the reservation is approved, the new incentive level shall be applied.

#### Conforming Projects – Non-residential Incentive Allocation – 5% of Distributed Generation Funds in 2008.

The non-residential incentive allocation framework allows market forces to play a major deciding role in the selection of projects when the volume of proposed projects exceeds the budget for non-residential projects. When the volume of proposed projects is relatively small so that the non-residential program is not fully subscribed, all conforming projects would be selected. In addition, a yearly review will be made to observe and review trends in requested and approved incentive levels. UNS Electric believes this element is important for the on-going management and potential adjustment of incentive levels as needed to respond to market conditions.

Non-residential funds will be equally divided into four quarters (Jan-Mar, Apr-Jun, Jul-Sep, and Oct-Dec). Funds within each period will be made available to projects based on a ranking generated by lowest expected life cycle credit purchase cost as provided in the application and verified by UNS Electric. In the event of a tie in the ranking, when the program would be fully subscribed if both projects were given reservation status, funds will be awarded based on the date of receipt of the completed reservation request.

In each three-month period, reservation requests will be accepted, but they will be reviewed by the utility only after the conclusion of the three month period. Once reservation requests are fully ranked in each reservation period, notification of reservation approvals and rejections will be made in conformance with the rankings and available funding.

Funds unused in one period will be equally divided among the remaining periods in that year. Funds allocated to non-residential projects will not roll forward from one year to the next. Reservations which are rejected as a result of insufficient program funds may elect to carry forward into the next period and retain the original reservation date. The election must be made at the time of the original application.

Within each period, projects submitted to the utility for reservation will be ranked based on a calculated index value for purposes of allocating non-residential funds as proposed in the application and verified by UNS Electric. Lowest lifecycle cost projects will be funded first. Indexing of the non-residential projects will be performed based on the verified incentive values and terms in the application for that project. Projects with higher incentive payments result in a higher expected life cycle credit purchase cost and projects that produce more kWh result in a lower expected life cycle credit purchase cost.

## **Conforming Projects Fund Contributions Between Residential and Non Residential**

Available funding will be split between residential and non-residential project classes. Initially 5% is being allocated to non residential system incentives and 95% is being allocated to residential system incentives. This split will be reapplied each quarter if all funds are not reserved.

### **Non-Conforming Projects – Allocation: 0% of Distributed Generation Funds in 2008.**

Non-conforming projects include, but are not limited to, projects with staged completion dates, multi-customer or multi-system projects, projects involving more than one technology where an interrelated incentive was not developed, projects requiring new or unique agreement terms, or projects requiring timelines differing from those offered to conforming projects. Non-conforming projects also include technologies for which a conforming incentive or technical qualifications were not developed at the time of this plan.

As detailed in the RECPP incentive allocation section of this plan, UNS Electric will disclose the allocation of funds for non-conforming projects in its implementation plan for the next year. UNS Electric will generally, but not always, include a minimum allocation to allow for the potential development of projects with technologies not included on the conforming project incentive matrix.

UNS Electric will apply a minimum of 50% and a maximum of 75% of the non-reserved, non-conforming project allocation to conforming project funding at the end of each calendar quarter. Unreserved non-conforming project allocations will not carry forward from one year to the next.

Incentives used for non-conforming projects must achieve similar economic efficiency as those incentives used in the conforming project category. Incentives applied for non-conforming projects must meet the lower of: 1) the maximum allowable incentive for the proposed technology as described in Attachment D, or 2) the average incentive value of projects accepted by UNS Electric for incentive disbursement for the proposed technology in the previous year.

Some qualifying technologies will not meet either of the previously described economic efficiency measures. Those applicants can negotiate the requested system or project incentive with UNS Electric. In no instance can the incentive exceed the highest calculated appropriate incentive payment value for projects approved by UNS Electric in the previous year.

Under some circumstances a non-conforming project may not identify the customer at project initiation. Regardless of the project design, implementation, or timeline, a customer must be identified at the time of system commissioning. Non-conforming funds will be disbursed upon filing by the customer and acceptance of project commissioning documentation by UNS Electric. For purposes of financing non-conforming projects, funds can be assigned to third parties.

Non-conforming systems must report system capacity (for up-front incentives) or production (for performance-based incentives) in general conformance with those same technologies as described in the conforming project requirements and be covered by similar warranties. For those technologies not described in the conforming project criteria, the reservation documentation must include details related to

warranty, system capacity and anticipated annual production. Metering equipment must be made available to UNS Electric during normal business hours for inspection and reporting purposes.

Initially, no funding would be allocated to the Non-Conforming Project class. However, if Non-Conforming Project applications are received, unused funds from the Conforming Project Classes may be allocated to the Non-Conforming Project class. Alternatively, if sufficient interest in developing Non-Conforming Projects is demonstrated, they could be accepted into the Conforming Project class after development and acceptance of technical standards and appropriate incentive values; or UNS Electric could request a special project fund allocation for a specific Non-Conforming Project in its annual REST Tariff Adjustor Mechanism and Implementation Plan filing.

Application Process  
ATTACHMENT A

System Qualifications

All solar electric generating Customer Systems must meet the following system and installation requirements to qualify for Tucson Electric Power Company's ("UNS Electric" or the "Company") GreenWatts™ SunShare Hardware Buydown Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Hardware Buydown Agreement.

1. A Residential Customer System must have a total solar array nameplate rating of at least 1,200 watts DC and no more than 30,000 watts DC. Any Non-Residential Customer System must have a total solar array nameplate rating of more than 1,200 watts DC.
2. The Customer System components must be certified as meeting the requirements of IEEE-929 - Recommended Practice for Utility Interface of Photovoltaic Systems.
3. The Customer System components must be certified as meeting the requirements of UL-1741 - Power Conditioning Units for use in Residential Photovoltaic Power and be covered by a non-prorated manufacturer's warranty of at least two years.
4. Photovoltaic components must be certified as meeting the requirements of UL-1703 - Standard for Flat Plate Photovoltaic Modules and Panels Systems and be covered by a non-prorated manufacturer's warranty of at least 20 years.
5. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code, including Article 690 and all grounding, conductor, raceway, over-current protection, disconnect and labeling requirements.
6. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code in effect in the jurisdiction where the installation is being completed (NEC), including, without limitation, Sections 200-6, 210-6, 230-70, 240-3, 250-26, 250-50, 250-122, all of Article 690 pertaining to Solar Photovoltaic Systems, thereof, all as amended and superseded.
7. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
8. The Customer System installation must meet the UNS Electric Service Requirements as follows:

"An AC disconnect means shall be provided in an area accessible at all times to the Company on all ungrounded AC conductors and shall consist of a lockable gang operated disconnect clearly

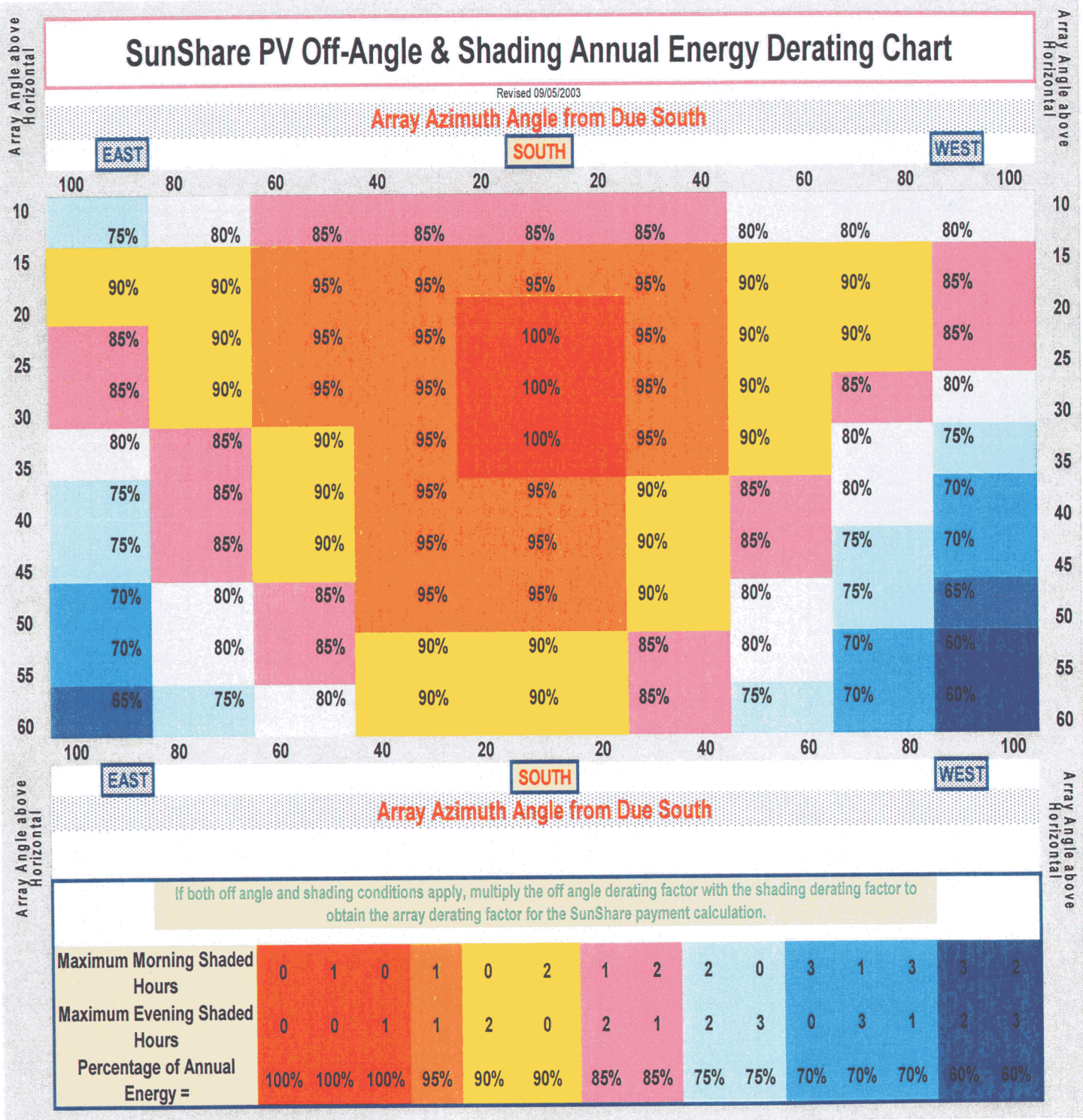


indicating open or closed. The switch shall be visually inspected to determine that it is open. The switch shall be clearly labeled "DG SERVICE DISCONNECT."

9. The Customer System photovoltaic panels and modules must face within +/- 100 degrees of real south, and be completely unshaded from three hours after sunrise to three hours before sunset. System arrays which are facing at an azimuth angle of more than 20 degrees from true south or shaded for more than one hour per day will be subject to a reduced amount of buydown payment per Attachment B.
10. The Customer System photovoltaic panels and modules must be fitted at an angle of 10 degrees to 60 degrees from horizontal. System arrays which are fitted with an elevation angle of less than 20 degrees or more than 35 degrees above horizontal will be subject to a reduced amount of buydown payment per Attachment B.
11. For Residential Customer Systems, Company will provide a meter and meter socket that will be installed in a readily accessible outdoor location by the Customer between the DC to AC converter and the connection to the over-current device in the Customer's electric service panel. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the DC to AC converter and the connection to the over-current device in the Customer's electric service panel.
12. Storage Batteries are not allowed as part of the Customer System unless the inverter is a separate component and UNS Electric can locate the Solar Meter at the inverter's output. If configured otherwise, battery losses will adversely reflect in the annual AC metered energy output. Customer's solar energy generation and energy storage system must meet the requirements of 2 and 3 of this Attachment A.
13. Installation must have been made after January 1, 1997.
14. The Customer must be connected to the Company's electric grid, except for approved off-grid systems in conformance with the RECPP.
15. The DC to AC inverter used must provide maximum power point tracking for the full voltage and current range expected from the photovoltaic panels used and the temperature and solar insolation conditions expected in Mohave County or Santa Cruz County, Arizona.
16. The DC to AC inverter must be capable of adjusting to "sun splash" from all possible combinations of cloud fringe effects without interruption of electric production.
17. All Customer System installations must be completed in a professional, workmanlike and safe manner.
18. Total voltage drop on the DC and AC wiring from the furthest PV module to the AC meter will not exceed 2%.

19. PV panels and DC to AC inverter will be installed with sufficient clearance to allow for proper ventilation and cooling. At a minimum, manufacturer clearance recommendations will be observed. In no case will PV modules be mounted less than 4 inches above any surface and an additional inch of clearance for each foot of continuous array surface beyond four feet in the direction parallel to the mounting support surface.

# **ATTACHMENT B** **SunShare PV Off-Angle & Shading Annual Energy Derating Chart**



## **ATTACHMENT C**

### **Supplemental Non-Residential System Qualifications**

**(Applicable Only for Customer Systems of Capacity Larger than 20,000 watts AC)**

1. All solar electric generating Non-Residential Customer Systems must meet the following additional system and installation requirements to qualify for UniSource Electric's ("UNS Electric" or the "Company") GreenWatts™ SunShare Hardware Buydown Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Hardware Buydown Agreement.
2. The Non-Residential Customer System shall be operating, substantially complete and have produced an AC output at least 70% of the total array nameplate DC rating at PTC as described below.
3. Operation, Maintenance and Repair. The Customer shall be solely responsible for the operation, maintenance and repair of the Non-Residential Customer System and any and all costs and expenses associated therewith. Company will notify Customer of all Non-Residential Customer System repairs the Company determines are reasonably necessary to support proper continued electrical production of the Non-Residential Customer System. The Customer will notify the Company within five (5) business days of its receipt of any such Company repair notice if the repair requires the installation of a new inverter and/or PV module. The Customer shall complete any such repair that affects the Non-Residential Customer System performance and does not require the purchase of a new inverter or PV module(s) within five (5) business days of the Company's notice of the need for such repair. For any such repair that does require the purchase and installation of a new inverter and/or PV module, the Customer shall promptly commence and diligently pursue such repair to completion, provided, in no event shall such repair take more than thirty (30) days to complete. At all times while Company is receiving the environmental credits from the Non-Residential Customer System, Customer shall clean all PV modules in the Non-Residential Customer System as necessary to keep them free from foreign material that would visibly obscure the modules, including any dirt and/or oils.
4. Non-Residential Customer System Security. At all times during and after installation of the Non-Residential Customer System, the Customer shall use commercially reasonable efforts to provide adequate security to prevent damage or vandalism to the Non-Residential Customer System.
5. Company shall provide Customer with a revenue grade AC meter to be installed between the Non-Residential Customer System and the grid interconnection. This meter will not be used for billing, but shall be used for any official Non-Residential Customer System production output data. Company will retain ownership of the meter and be responsible for its repair if needed.
6. The utility interactive solar generation Non-Residential Customer System shall deliver an AC output in AC watts at least equal to 70% of the total array nameplate rating in DC watts as measured at performance test conditions (PTC) of 1000 watts/m<sup>2</sup> irradiance, 68 degrees F. ambient temperature and a maximum of a 2.4 mph wind speed. The Customer will verify performance of

the system with a 30 day test using a temporary data monitor and acquisition system or make a single point measurement to determine the output of the system.

7. The Customer shall verify and demonstrate to Company the proper calibration and operation, through a temporary data monitor and acquisition system, of the solar insolation sensor, the ambient temperature sensor, the wind speed sensor and the AC power meter within +/- 2% of Company independent sensor data. If performance test data is not available at PTC, the indicated AC power output of the Non-Residential Customer System will be corrected to PTC by the following formula:

$$\text{Power(PTC)} = ((\text{Power(Meter)} * (1000 / \text{SolarSensor(W/M}^2))) * (1 + (((\text{AmbientTempSensor(DegF)}) - 68) * 0.0026)))$$

(On the condition that data used in the formula is taken on a cloudless day at a solar insolation of at least 950 watts per square meter and wind speed is less than 2.4 mph)

8. Company shall have the right to challenge the accurate calibration of the sensors and temporary data monitor and acquisition system with proper documentation demonstrating the reasons for the challenge. The Customer shall resolve the challenged sensor or temporary data monitor and acquisition system calibration to the satisfaction of Company prior to the data being used in the performance test being recorded.
9. Customer shall provide Company with no less than ten (10) days prior notice of any planned Customer tests to the Non-Residential Customer System. Company shall have the right to be present at any and all tests of the Non-Residential Customer System. The Customer shall provide Company notice as soon as the Non-Residential Customer System has been installed and has passed all Customer tests.
10. Customer shall provide Company with all documentation reasonably requested by Company to demonstrate to the Commission that any environmental credits transferred under the Agreement were derived from an eligible technology, that the kWh generated are accurately reported and that the environmental credits have not expired or been used by any other entity for any purpose.
11. If certified proof can not be provided of complete galvanic isolation of any and all DC from the AC output of the inverter(s) used in the Non-Residential Customer System through IEEE-1547 certification of the inverter, the Non-Residential Customer System shall include an isolation transformer installed between the inverter(s) and the grid interconnection. The transformer will be rated at full load continuous operation at 50 degrees C. at 125% of nameplate DC array rating and have an efficiency rating at nameplate DC array rating power of at least 98% as tested. The transformer will have at least one tap each of 2.5% and 5% both above and below the nominal voltage tap.



## ATTACHMENT D

### RECPP – CONFORMING PROJECT INCENTIVE MATRIX

2008 and 2009 Program Year

Technology/Application	UP FRONT INCENTIVE <sup>1</sup>	10-Year REC Agreement <sup>2</sup> 10-Year Payment (\$/kWh)	15-Year REC Agreement <sup>2</sup> 15-Year Payment (\$/kWh)	20-Year REC Agreement <sup>2</sup> 20-Year Payment (\$/kWh)
BIOMASS/BIOGAS (Electric)	NA	0.060	0.056	0.054
BIOMASS/BIOGAS – CHP (Electric) <sup>3</sup>	NA	0.035	0.032	0.031
BIOMASS/BIOGAS – CHP (Thermal) <sup>3</sup>		0.018	0.017	0.016
BIOMASS/BIOGAS (thermal)	NA	0.015	0.014	0.013
BIOMASS/BIOGAS (cooling)	NA	0.032	0.030	0.029
DAYLIGHTING (Non-Residential)	\$0.20/kWh <sup>7</sup> See this note for clarification	NA	NA	NA
GEOTHERMAL – (electric)	NA	0.024	0.022	0.022
GEOTHERMAL – (thermal)	1.00/Watt	0.048	0.045	0.043
GEOTHERMAL – (cooling)	NA	0.032	0.030	0.029
SMALL HYDRO	NA	0.060	0.056	0.054
SMALL WIND (grid-tied) <sup>4</sup>	\$2.50/Watt AC	0.145	0.135	0.130
SMALL WIND (off-grid) <sup>4</sup>	\$2.00/Watt AC	0.116	0.108	0.104
SOLAR ELECTRIC:				
RESIDENTIAL (GRID-TIED)	\$4.50/Watt DC <sup>8</sup>	0.202	0.187	0.180
Non-Residential (Grid-Tied) 20 kW or less	\$2.50/Watt DC <sup>8</sup>	0.202	0.187	0.180
NON-RESIDENTIAL (GRID-TIED) More than 20 kW	NA	0.202	0.187	0.180
RESIDENTIAL (OFF-GRID)	\$2.00/Watt DC <sup>8</sup>	NA	NA	NA
NON-RESIDENTIAL (OFF-GRID)	NA	0.121	0.112	0.108
SOLAR SPACE COOLING <sup>5</sup>	NA	0.129	0.120	0.115
SOLAR WATER HEATING/SPACE HEATING <sup>5</sup> (Non-Residential)	NA	0.057	0.052	0.051
RESIDENTIAL SOLAR WATER/SPACE HEATING <sup>6</sup>	\$1,500.00 plus \$0.50/kWh to a maximum of \$3,500.00 <sup>9, 10</sup>	0.057	0.052	0.051
NON-RESIDENTIAL POOL HEATING	NA	0.012	0.011	0.011

## RECPP – CONFORMING PROJECT INCENTIVE MATRIX

2010 and 2011 Program Year

Technology/Application	UP FRONT INCENTIVE <sup>1</sup>	10-Year REC Agreement <sup>2</sup>	15-Year REC Agreement <sup>2</sup>	20-Year REC Agreement <sup>2</sup>
	20-Year REC Agreement	10-Year Payment (\$/kWh)	15-Year Payment (\$/kWh)	20-Year Payment (\$/kWh)
BIOMASS/BIOGAS (Electric)	NA	0.054	0.050	0.048
BIOMASS/BIOGAS – CHP (Electric) <sup>3</sup>	NA	0.032	0.029	0.028
BIOMASS/BIOGAS – CHP (Thermal) <sup>3</sup>		0.016	0.015	0.014
BIOMASS/BIOGAS (thermal)	NA	0.014	0.013	0.012
BIOMASS/BIOGAS (cooling)	NA	0.029	0.027	0.026
DAYLIGHTING (Non-Residential)	\$0.18/kWh <sup>7</sup> See this note for clarification	NA	NA	NA
GEOTHERMAL – (electric)	NA	0.022	0.020	0.019
GEOTHERMAL – (thermal)	0.90/Watt	0.044	0.040	0.039
GEOTHERMAL – (cooling)	NA	0.029	0.027	0.026
SMALL HYDRO	NA	0.054	0.050	0.048
SMALL WIND (grid-tied) <sup>4</sup>	\$2.25/Watt AC	0.131	0.121	0.117
SMALL WIND (off-grid) <sup>4</sup>	\$1.80/Watt AC	0.105	0.097	0.094
SOLAR ELECTRIC:				
RESIDENTIAL (GRID-TIED)	\$4.00/Watt DC <sup>8</sup>	0.182	0.168	0.162
Non-Residential (Grid-Tied) 20 kW or less	\$2.25/Watt DC <sup>8</sup>	0.182	0.168	0.162
NON-RESIDENTIAL (GRID-TIED) More than 20 kW	NA	0.182	0.168	0.162
RESIDENTIAL (OFF-GRID)	\$1.80/Watt DC <sup>8</sup>	NA	NA	NA
NON-RESIDENTIAL (OFF-GRID)	NA	0.109	0.101	0.097
SOLAR SPACE COOLING <sup>5</sup>	NA	0.116	0.108	0.104
SOLAR WATER HEATING/SPACE HEATING <sup>5</sup> (Non-Residential)	NA	0.051	0.047	0.045
RESIDENTIAL SOLAR WATER/SPACE HEATING <sup>6</sup>	\$1,350.00 plus \$0.45/kWh to a maximum of \$3,150.00 <sup>9, 10</sup>	0.051	0.047	0.045
NON-RESIDENTIAL POOL HEATING	NA	0.011	0.010	0.010



## RECPP – CONFORMING PROJECT INCENTIVE MATRIX

2012 Program Year

Technology/Application	UP FRONT INCENTIVE <sup>1</sup>	10-Year REC Agreement <sup>2</sup> 10-Year Payment (\$/kWh)	15-Year REC Agreement <sup>2</sup> 15-Year Payment (\$/kWh)	20-Year REC Agreement <sup>2</sup> 20-Year Payment (\$/kWh)
	20-Year REC Agreement			
BIOMASS/BIOGAS (Electric)	NA	0.046	0.043	0.041
BIOMASS/BIOGAS – CHP (Electric) <sup>3</sup>	NA	0.027	0.025	0.024
BIOMASS/BIOGAS – CHP (Thermal) <sup>3</sup>		0.014	0.013	0.012
BIOMASS/BIOGAS (thermal)	NA	0.011	0.011	0.010
BIOMASS/BIOGAS (cooling)	NA	0.025	0.023	0.022
DAYLIGHTING (Non-Residential)	\$0.15/kWh <sup>7</sup> See this note for clarification	NA	NA	NA
GEOHERMAL – (electric)	NA	0.019	0.017	0.017
GEOHERMAL – (thermal)	0.77/Watt	0.037	0.034	0.033
GEOHERMAL – (cooling)	NA	0.025	0.023	0.022
SMALL HYDRO	NA	0.046	0.043	0.041
SMALL WIND (grid-tied) <sup>4</sup>	\$1.91/Watt AC	0.111	0.103	0.099
SMALL WIND (off-grid) <sup>4</sup>	\$1.53/Watt AC	0.089	0.082	0.080
SOLAR ELECTRIC:				
RESIDENTIAL (GRID-TIED)	\$3.30/Watt DC <sup>8</sup>	0.154	0.143	0.138
Non-Residential (Grid-Tied) 20 kW or less	\$1.91/Watt DC <sup>8</sup>	0.154	0.143	0.138
NON-RESIDENTIAL (GRID-TIED) More than 20 kW	NA	0.154	0.143	0.138
RESIDENTIAL (OFF-GRID)	\$1.53/Watt DC <sup>8</sup>	NA	NA	NA
NON-RESIDENTIAL (OFF-GRID)	NA	0.093	0.086	0.083
SOLAR SPACE COOLING <sup>5</sup>	NA	0.099	0.092	0.088
SOLAR WATER HEATING/SPACE HEATING <sup>5</sup> (Non-Residential)	NA	0.043	0.040	0.039
RESIDENTIAL SOLAR WATER/SPACE HEATING <sup>6</sup>	\$1,200.00 plus \$0.325/kWh to a maximum of \$2,500.00 <sup>9, 10</sup>	0.043	0.040	0.039
NON-RESIDENTIAL POOL HEATING	NA	0.009	0.009	0.008

### Notes:

- 1) Residential projects are eligible for an up front incentive (UFI). UFI payments can not exceed 60% of the cost of renewable energy equipment.
- 2) Non-residential under 20 kW is preferably UFI but can be a PBI. Non-residential 20 kW and greater is PBI only. The total of payments under a production based incentive can not exceed 60% of the project costs for any project.
- 3) The CHP incentives may be used in combination for the appropriate components of one system.
- 4) This PBI applies to a maximum system size of 100 kW. Larger wind systems may apply for incentives as NCP.
- 5) The solar space heating and cooling incentives may be used in combination for the appropriate components of one system.
- 6) This category includes both traditional water heating and those systems combined with residential solar water heating used for space heating. Space heating applications require a report detailing energy saving for the complete system.
- 7) Rate applies to measured first five years of energy savings only. Payments are made over a five year period.
- 8) Some installations will require an adjustment of the incentive as detailed in the PV Incentive Adjustment Chart.
- 9) Energy savings rating is based on the SRCC OG-300 published rating or the UNS Electric-RECPP Space Heating Calculator. The customer contribution must be a minimum of 15% of the project cost after accounting for and applying all available Federal and State incentives.
- 10) Rate applies to forecast/measured first year energy savings only.

NA – Not Available



# ATTACHMENT E

## Solar Space Heating UFI Incentive Calculation Procedure.

In Advance, please perform the Design Review and Utility Bill Review (if Applicable) for numbers to enter in Steps #1, #2 and #5.

Elevation Zone Table:			
Min Elevation	Max Elevation	Heating Season Days	Daily Panel Heat Output
-1000	1000	105	0
1001	3000	140	0
3001	5000	175	0
5001	7000	210	0
7001	9000	245	0
9001	11000	280	0

Collector Thermal Performance Rating Data From OG-100 Sheet		
Category:	Delta T	Clear Day
A	-9 Deg. F.	0
B	+9 Deg. F.	0
C	+36 Deg. F.	0
D	+90 Deg. F.	0
E	+144 Deg. F.	0

Enter Solar Panel Make and Model Number Selected for Project:

Step #1:	Enter the result of the Design Review of the Design Annual Building Loss =	0	BTU/Year
Step #2:	Enter the result of the Utility Bill Review of the Actual Annual Building Loss: (If not Electric, Natural Gas or Propane Heat, enter 0) =	0	BTU/Year
Step #3:	Calculate the Lesser of the Result in Step #1 & Step #2 = This is the Annual Heating Heat Requirement.	0	BTU/Year
Step #4:	Enter Elevation of the Solar Space Heated Building:	0	Feet AMSL
Step #4 cont:	Number of Heating Days per Heating Season from Elevation Zone Table:	105	Days per Year
Step #4 cont:	Calculate Average Daily Building Heat Requirement =	0	BTU/Day
Step #5:	Enter Passive Heat Storage Specific Heat Capacity from Building Design Review:	0	BTU/Deg. F.
Step #5 cont:	Enter Maximum Daily Room Temperature Variation Allowed by Building Occupants: (Max of 10 Degrees F.)	0	Degrees F.
Step #5 cont:	Calculate Maximum Passive Heat Storage Capacity =	0	BTU
Step #5 cont:	Enter Total Active Heat Storage Heat Capacity from Building Design Review:	0	BTU
Step #5 cont:	Calculate Maximum Total Heat Storage Capacity =	0	BTU
Step #6:	Calculate the Lesser of the Average Daily Building Heat Requirement in Step #4 and the Maximum Total Storage Capacity in Step #5. This is the Maximum Useful Daily Solar Heat Input.	0	BTU/Day
Step #7:	Size the Solar Panels based on a total daily solar heat input no greater than the Maximum Useful Daily Solar Heat Input. Enter the single panel SRCC OG-100 Collector Thermal Performance Rating data in the Table Above.	0	BTU/Day per Panel
Step #7cont:	Enter the Total number of solar panels to be installed:	0	# of Panels
Step #7cont:	Calculate the Average Expected Daily Solar Heat Input:	0	BTU/Day
Step #8:	Calculate the Expected Annual Useful Solar KWH Heat Input using the Number of Heating Days times the Average Expected Daily Solar Heat Input / 3415 BTU/KWH:	0	KWH/Year
Step #9:	Enter the UFI per first year KWH UCPP Incentive Rate:	\$0.75	\$/KWH
Step #9 cont:	Calculate the Total Maximum UFI Payment Subject to Possible Limitation by the 50% of Initial Cost Cap & 15% Minimum Customer Contribution:	\$0.00	\$
Step #10:	Enter the Total Solar Space Heating System Initial Cost: This should not include costs for Passive Heat Storage or Building Heating System.	\$0.00	\$
Step #10 cont:	Calculate the Total Expected Federal and Arizona Incentives for this Project:	\$0.00	\$
Step #10 cont:	Calculate the 15% minimum of the Total Solar Space Heating System Initial Cost to be paid by Customer	\$0.00	\$
Step #10 cont:	Calculate the Total Actual UFI Payment:	\$0.00	\$



# Attachment 9

**UNS Electric, Inc. Renewable Energy Standard & Tariff  
Full Compliance Opportunity Plan  
Cost Recovery Factors Definition for 2008**

**Total REAP Budget 2008: \$4,275,753**

**Purchased Renewable Energy: \$451,840**

- Above Market Cost of Conventional Generation calculated annually on hourly data per MCCCCG Matrix **\$424,840 586,668<sup>aa</sup>**
- Transmission direct use cost **\$0**
- Transmission planning cost allocation **\$0**
- Transmission Line loss cost **\$0**
- Grid management ancillary services and day ahead unit commitment cost **\$0**
- Grid stability analysis cost allocation **\$5,000<sup>ab</sup>**
- Fuel and maintenance costs associated with increased combustion turbine use and operating load range ramp cycles to manage over/under scheduled renewable resource energy deliveries **\$0**
- RFP preparation, issue and evaluation cost **\$2,000<sup>ac</sup>**
- Independent Auditor cost **\$10,000<sup>ad</sup>**
- Loss of revenue from off system sales lost due to transmission constraints created by transmission allocated to renewable PPA energy delivery **\$0**
- Labor overhead allocation cost for purchased renewable power contracts **\$10,000<sup>ae</sup>**
- In state renewable resource economic development premium payment cost **\$0**

**Customer Sited Distributed Renewable Energy: \$3,582,013**

- Up front subsidy payment to customers cost **\$2,613,728<sup>ba</sup>**
- Annual production based performance payment to customers cost **\$126,971<sup>bb</sup>**
- Builder solar energy system subsidy program material cost **\$0<sup>bc</sup>**
- Interconnection and net meter application processing labor cost **\$25,000<sup>bd</sup>**
- Acceptance testing cost **\$100,000<sup>be</sup>**
- Customer technical support cost **\$35,000<sup>bf</sup>**
- Annual meter reading cost **\$5,000<sup>bg</sup>**
- Support tools, materials, transportation and supply cost **\$25,000<sup>bh</sup>**
- Direct internal labor cost for administration of the customer sited renewable generation program **\$50,000<sup>bi</sup>**
- Outside services and internal labor for public outreach, education program and GreenWatts.com website maintenance cost **\$500,000<sup>bj</sup>**

- Grid management cost \$0
- Grid stability analysis cost allocation \$0<sup>bk</sup>
- Cost of service contracts for outside labor for inspections and maintenance \$25,000<sup>bl</sup>
- Corporate overhead, Stores loads, Small Tools loads, Common Systems loads, Building allocation and other transaction allocation cost for customer sited renewable distributed generation programs \$76,314<sup>bm</sup>
- Loss of revenue from the fixed cost portion of customer charges displaced by customer self generation \$0

#### **Customer Care and Billing program (CC&B): \$50,000**

- Annual administrative CC&B cost allocation based on share of transactions processed \$25,000<sup>ca</sup>
- Initial database and customer interface program development and program revision cost \$0<sup>cb</sup>
- Capital A&G load allocations for above development work \$0<sup>cc</sup>
- CC&B incremental transaction allocation cost for CC&B support \$25,000<sup>cd</sup>

#### **Energy Management System and Energy Accounting and Settlements (EMS&EAS): \$85,000**

- Annual administrative EMS&EAS cost allocation based on share of transactions processed \$25,000<sup>da</sup>
- Initial database and program revision cost \$50,000<sup>db</sup>
- Capital A&G load allocations for above development work \$5,000<sup>dc</sup>
- Labor overhead allocation cost for EMS&EAS \$5,000<sup>dd</sup>

#### **Net Metering: \$26,400**

- Direct material cost for meters \$10,000<sup>ea</sup>
- Labor cost for meter installations \$10,000<sup>eb</sup>
- CC&B program revision cost \$4,000<sup>ec</sup>
- Direct energy credit purchase cost \$0
- Net metering rate design cost \$0
- Time of Use Net metering program development cost \$0<sup>ed</sup>
- Net Metering data interval recording for load research and program metrics evaluation \$0<sup>ee</sup>
- Communications for net metering data retrieval \$0<sup>ef</sup>
- Labor overhead, Stores load and CC&B transaction allocation cost for net metering programs \$2,400<sup>eg</sup>

## **Reporting: \$60,500**

- Annual Compliance Report and hearing cost \$5,000<sup>fa</sup>
- Annual Planning and Implementation Report and hearing cost \$25,000<sup>fb</sup>
- Annual Tariff review and hearing cost \$25,000<sup>fc</sup>
- Labor overhead and CC&B transaction allocation cost for reporting \$5,500<sup>fd</sup>

## **Outside Coordination and Support: \$20,000**

- Support through providing information and answering questions of national energy labs cost \$0<sup>ga</sup>
- Support through providing information and testing equipment of renewable energy equipment vendors cost \$0<sup>gb</sup>
- Responding to renewable energy questions from non UNSE customers cost \$0<sup>gc</sup>
- Support of outside service territory renewable energy interest cost \$0<sup>gd</sup>
- WREGIS and other renewable energy certification agency fee cost \$0
- Utility Wind Interest Group fee cost \$0<sup>ge</sup>
- Solar Electric Power Association fee cost \$0<sup>gf</sup>
- Other renewable energy association fees as needed cost \$0<sup>gg</sup>
- Training, travel, memberships, periodicals, etc cost \$20,000<sup>gh</sup>
- Labor overhead allocation cost for outside coordination and support \$0<sup>gi</sup>

## **Renewable Energy Hardware Development: \$0**

- Technology development projects – geothermal heat pumps, residential solar units, residential wind generation, etc cost \$0<sup>ha</sup>
- Energy storage demonstration project cost \$0<sup>hb</sup>
- Operation and maintenance of renewable generation systems cost \$0<sup>hc</sup>
- Renewable energy resource monitoring program cost \$0<sup>hd</sup>
- Support of Arizona wide renewable energy studies cost \$0<sup>he</sup>
- Up front funded renewable technology construction cost \$0<sup>hf</sup>
- Development of wind and solar forecasting program costs \$0<sup>hg</sup>
- Development of load shed systems for managing rapid changes in renewable energy generation levels cost \$0<sup>hh</sup>
- Property taxes, sales taxes and insurance for renewable energy hardware costs \$0<sup>hi</sup>
- Labor overhead, Stores loads, allocation cost for renewable energy hardware development \$0<sup>hj</sup>

**Notes:**

- aa:** 27,673 MWh @ \$15.40 per MWh above cost of MCCCCG – Purchased Power. Contracts are in addition to existing power purchase contracts, costs are incremental and caused by renewable purchased power contracts.
- ab:** Annual analysis of hourly delivery intermittencies on grid stability, forecasting development – internal UNSE personnel, 50 hours. Evaluation time is in addition to existing power purchase analysis and due to time variant nature of wind power, costs are incremental and caused by renewable purchased power contracts.
- ac:** Internal development, review, posting, query response, evaluation, contract development and close out – internal UNSE personnel, 20 hours. RFPs are in addition to existing power purchase RFPs, costs are incremental and caused by renewable purchased power contracts.
- ad:** Historic cost basis.
- ae:** Contract administration, settlement review, payment approval, internal overhead – internal UNSE personnel, 100 hours. Contracts are in addition to existing power purchase contracts, costs are incremental and caused by renewable purchased power contracts.
- ba:** Residential – 60% will be PV. 0.444 MWDC of PV in 2008. @ \$4.50 per watt DC = \$1.998M. 40% will be SDWH. 0.616 MWT of SDWH in 2008. @ \$1.00 per watt = \$0.616M. Commercial – 25% will be PV with 0% as UFI and 100% as PBI – 0 MWDC in 2008. The 2008 total = \$2,613,728
- bb:** Commercial PBI – 25% \* 3.078 MWh/yr/ @ \$0.18 = \$0.07M. The other 75% commercial as thermal – 75% \* 3,078 MWh @ \$0.05/kWh = \$0.06M. The 2008 total = \$126,971
- bc:** Assumes 0 kWDC of pilot program @ \$10/wattDC.
- bd:** 0.5 people @ 350 units /person-year. Currently 200 units / person year productivity.
- be:** 2 people @ 400 units /person-year. Currently 200 units / person year productivity.
- bf:** 0.5 people @ 1000 units /person-year. Currently 400 units / person year productivity.
- bg:** 2,000 meter reads per year including reporting and processing of data into reports
- bh:** Vehicles, tools, consumables for 2 mobile units and 4 departmental personnel
- bi:** 0.5 supervisory/managerial people @ 1000 units /person-year. Currently 200 units / person year productivity.
- bj:** \$0.4M direct outreach education expense with providers plus 1 people managing program and contractors/service providers,
- bk:** Studies of solar time variant output impact on distribution grid. Review of solar capacity value. Used for matching grant funding. 0 person assigned.

- bl:** Used for annual inspections, customer support. Based on historic costs extrapolated to 1,200 customers from \$25,000/year for 300 customers.
- bm:** Calculated as 10% of internal labor costs = \$21,500 plus 2% of transaction costs = \$54,814  
Total = \$76,314
- ca:** Initial estimate – discovery in progress.
- cb:** Initial estimate – discovery in progress.
- cc:** Initial estimate – discovery in progress.
- cd:** Initial estimate – discovery in progress.
- da:** Initial estimate – discovery in progress.
- db:** Initial estimate – discovery in progress.
- dc:** Initial estimate – discovery in progress.
- dd:** Initial estimate – discovery in progress.
- ea:** 120 net meters @ \$50 per meter plus 700 SunShare meters @ \$50 per meter
- eb:** 120 site installations @ \$70 per site.
- ec:** Initial estimate – discovery in progress. Recovery over 1 year period.
- ed:** Initial estimate – discovery in progress. Recovery over 1 year period.
- ee:** Future One Quarter time for an energy analyst to collate data, prepare analysis and review cost impacts and effect on lost revenues of net metering.
- ef:** Future One Quarter time for an energy analyst for on going program review and quality control review of net metering program.
- eg:** Calculated as 10% of internal labor costs = \$2,400 plus 2% of transaction costs = \$0 Total = \$2,400
- fa:** Historic cost basis, extrapolated to a larger program with more reporting factors.
- fb:** Historic cost basis, extrapolated to a larger program with more reporting factors.
- fc:** Historic cost basis, extrapolated to a larger program with more reporting factors.
- fd:** Calculated as 10% of internal labor costs = \$5,500 plus 2% of transaction costs = \$0 Total = \$5,500
- ga:** Historic cost basis, extrapolated to a larger program with more reporting factors. Program manager level respondent.

- gb: Historic cost basis, extrapolated to a larger program with more reporting factors. Program manager level respondent.**
- gc: Historic cost basis, extrapolated to a larger program with more reporting factors. Program manager level respondent.**
- gd: Historic cost basis, extrapolated to a larger program with more reporting factors. Administrative level respondent.**
- ge: Based on proposal.**
- gf: Historic based.**
- gg: Historic based. Biomass, Geothermal, etc.**
- gh: Historic based for 4 employees.**
- gi: Calculated as 10% of internal labor costs = \$0 plus 2% of transaction costs = \$0 Total = \$0**
- ha: Estimated based on project size and mix.**
- hb: Estimated based on project size and mix.**
- hc: Historic based. OH, DMP and SGSSS**
- hd: Historic based.**
- he: Historic based.**
- hf: Operating Headquarters Test Yard – 0 kWDC**
- hg: Matching funds for grants in application.**
- hh: Matching funds for grants in application.**
- hi: Historic based.**
- hj: Calculated as 10% of internal labor costs = \$0 plus 2% of transaction costs = \$0 Total = \$0**





# EXHIBIT 1a



**Renewable Energy Standard & Tariff Surcharge  
REST-TS1  
Renewable Energy Program Expense Recovery  
(Full Compliance Opportunity Plan)**

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APPLICABILITY

Mandatory, non-bypassable surcharge applied to all energy consumed by all customers throughout Company's entire electric service area.

RATES

For all energy billed which is supplied by the Company to the customer, the price shall be \$0.004988 per kWh of metered monthly energy consumption on all kWh consumed per meter that month over 500 kWh up to and including a monthly cap of:

For residential customers: \$5.20 per month.  
For small commercial customers: \$39.00 per month.  
For large commercial customers: \$1,500.00 per month.

A large commercial customer is one with monthly demand in excess of 3,000 kW for the three consecutive months preceding the current billing period.

For non-metered services, the lesser of the load profile or otherwise estimated kWh required to provide the service in question, or the service's contract kWh shall be used in the calculation of the surcharge.

This charge will be a line item on customer bills reading "Arizona Corporation Commission Renewable Energy Standard & Tariff."

RULES AND REGULATIONS

The standard Rules and Regulations of the Company as on file with the Arizona Corporation Commission shall apply where not inconsistent with this tariff.

TAX CLAUSE

To the charges computed under the above rate, including any adjustments, shall be added the applicable proportionate part of any taxes or governmental impositions which are or may in the future be assessed on the basis of gross revenues of the Company and/or the price or revenue from the electric energy or service sold and/or the volume of energy generated or purchased for sale and/or sold hereunder.

RELATED SCHEDULES

- UNS Electric, Inc. – Rules and Regulations

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Filed By: Raymond S. Heyman  
Title: Senior Vice President  
District: Entire Electric Service Area

Tariff No.: REST-TS1  
Effective: Pending  
Page No.: 1 of 1



# EXHIBIT 1b

**Description of Renewable Energy Standard & Tariff  
Adjustor Mechanism Tariff Rate  
UNS Electric, Inc. - Full Compliance Opportunity Plan**

**Concept:**

- All customers will be billed for REST programs on a \$0.004988 per kWh of energy consumed in a given month as then capped monthly. However, different customer classes will be capped at different monthly levels as follows:
  - Residential customers will be billed the REST Tariff Surcharge rate on the amount of metered monthly energy consumption up to 1,043 kWh which equal to a monthly cap of \$5.20. Amounts of consumption above 1,043 kWh per month will not be assessed a REST Tariff Surcharge.
  - Small Commercial customers will be billed the REST Tariff Surcharge rate on the amount of metered monthly energy consumption up to 7,819 kWh which equal to a monthly cap of \$39.00. Amounts of consumption above 7,819 kWh per month will not be assessed a REST Tariff Surcharge.
  - Large Commercial customers will be billed the REST Tariff Surcharge rate on the amount of metered monthly energy consumption up to 300,722 kWh which equal to a monthly cap of \$1,500.00.. Amounts of consumption above 300,722 kWh per month will not be assessed a REST Tariff Surcharge.
  - A large commercial customer is one with monthly demand in excess of 3,000 kW for the three consecutive months preceding the current billing period.
  - All fixed monthly rate, non-metered, customers will be billed the REST Tariff Surcharge rate on the lesser of the load profile or otherwise estimated energy in kWh required to provide the service, or the service's contract energy amount in kWh shall be used in the calculation of the surcharge.

**Rate Structure for Subject Year:**

REST Tariff Surcharge rate = \$0.004988 per kWh of applicable metered monthly consumption per month to the cap values.

### Sample Bill Example Calculations:

Residential customer consumes 450 kWh in the month. Therefore the REST charge = \$2.24 for the month. This represents an average consumption of 0.6 kW for all hours of the month, a bit less than average.

*(Average year round UNS Electric residential customer monthly consumption is about 872 kWh which represents average consumption of 1.19 kW for all hours of the month.)*

Residential customer consumes 1,250 kWh in the month. Only the first 1,043 kWh are used in the calculation. Therefore the REST charge = \$5.20 for the month. This represents an average consumption of 1.7 kW for all hours of the month, a bit more than average.

Residential customer consumes 8,250 kWh in the month. Only the first 1,043 kWh are used in the calculation. Therefore the REST charge = \$5.20 for the month. This represents an average consumption of 11.5 kW for all hours of the month, a lot more than average.

A small Commercial customer consumes 3,250 kWh in the month. Therefore the REST charge = \$16.21 for the month. This represents an average consumption of 4.5 kW for all hours of the month.

A medium Commercial customer consumes 24,250 kWh in the month. Only the first 7,819 kWh are used in the calculation. Therefore the REST charge = \$39.00 for the month. This represents an average consumption of 34 kW for all hours of the month.

A large Commercial customer consumes 75,250 kWh in the month. Only the first 7,819 kWh are used in the calculation. Therefore the REST charge = \$39.00 for the month. This represents an average consumption of 104.5 kW for all hours of the month.

A medium size Industrial customer consumes 3,275,000 kWh in the month. Only the first 300,722 kWh are used in the calculation. Therefore the REST charge = \$1,500.00 for the month. This represents an average consumption of 4,549 kW for all hours of the month.



# EXHIBIT 1c

**UNS Electric, Inc. Uniform Credit Purchase Program**

**Full Compliance Opportunity Plan**

**Renewable Energy Credit Purchase Program**

**(RECPP)**

**Definition**

### **UNS Electric, Inc. Renewable Energy Credit Purchase Program (RECPP)**

UNS Electric, Inc. ("UNS Electric") is committed to assisting our customers develop their own renewable generation resources, through a balanced and supportive renewable energy distributed generation incentive program. Our goal is to create a program that will provide incentives for affordable, environmentally sensitive, customer-sited renewable energy generation systems to supplement UNS Electric customer's energy needs. A properly designed system, matched to a customer's energy use, will provide a reduction in utility bills through the use of renewable resources. This program reflects our commitment to reduce the cost of developing renewable energy resources in partnership with our customers and help provide our customers with clean energy options.



## Defined Terms

**ACC** – Arizona Corporation Commission.

**AZROC** – Arizona Registrar of Contractors.

**Applicant** – Utility customer of record for the Utility Revenue Meter located at the installation site; a builder of the structure (residential or non-residential) who will reserve and install the Qualifying system; or for an off-grid Qualifying System, the property owner for the installation site located within a Utility's service territory.

**Arizona Business License** – A business license issued by the ACC.

**Cancelled** – Reservation Status indicating that a Reservation has been terminated, funding is no longer allocated, and the utility has removed the reservation from the funding queue.

**Cancellation** – The termination of the Reservation.

**Commissioned** – Qualifying System certified to be in operation.

**Commissioning Package** – Written verification signed by the installer and the customer confirming that the system has been installed in conformance with the approved reservation and that the system is ready for operation.

**Conforming Project** – Any project utilizing a renewable technology listed in Attachment D.

**Conformance Inspection** – Inspection performed by the utility to verify that the system has been installed and operates in conformance with the Reservation application.

**Customer** -- Utility customer of record for the Utility Revenue Meter located at the installation site or a builder of the structure (residential or non-residential) who will reserve and install the Qualifying System.

**Extension** – The extension of the Reservation Timeframe.

**Installer** – The entity or individual responsible for the installation of a qualifying system.

**Interconnection Inspection** – Inspection performed by the utility to confirm that the system can be safely interconnected to the power grid.

**Non-Conforming Project** – Non-conforming projects include, but are not limited to, projects with staged completion dates, multi-customer or multi-system projects, projects involving more than one technology, projects requiring new or unique agreement terms, projects with technologies for which qualification standards have not been developed or projects requiring non-standard timeframes.

**Performance Based Incentive (PBI)** – Incentive based on a rate per kWh output or equivalent kWh of energy savings.

**Project Costs** – System Costs plus financing costs.

**Proof of Project Advancement** – Documentation demonstrating that a project is progressing on schedule and is staged for Commissioning on or before the end of the Reservation Timeframe.

**Qualifying System** – Distributed renewable energy systems meeting the qualifications for production of qualified Renewable Energy Credits in Arizona acceptable to the Arizona Corporation Commission as they may be defined for affected utilities to meet any renewable energy standards.

**Renewable Energy Credit (REC)** – One Renewable Energy Credit is created for each kWh, or kWh equivalent for non-generating resources, derived from an eligible renewable energy resource. RECs shall include all environmental attributes associated with the production of the eligible renewable energy resource.

**Reservation** – A dollar amount committed by the utility to fund a project if all program requirements are met.

**Reservation Status** – Indicator relating to approval or denial of a Reservation request. If a Reservation is approved, the Reservation Status is Reserved. If a Reservation request is denied, the Reservation Status is either Cancelled or Wait Listed.

**Reserved** – Status indicating the acceptance of a Reservation request.

**Reservation Timeframe** – The duration of the utility's funding commitment for a Reservation.

**System Costs** -- Costs associated with the Qualifying System components, direct energy distribution, system control/metering, and standard installation costs directly related to the installation of the Qualifying System.

**Up Front Incentive (UFI)** – One time incentive payment based on system capacity or estimated energy kWh production rather than on measured system output.

**Wait List** – Status indicating Applicant has met program requirements, but the Utility has insufficient funding to commit to funding the project.

## **UNS Electric Renewable Energy Credit Purchase Program (RECPP) Review Panel**

UNS Electric will participate in a RECPP Review Panel for ongoing review and modification of all Renewable Distributed Generation programs, as prescribed by the ACC. UNS Electric believes that the Review Panel making recommendations to expeditiously modify all UNS Electric renewable programs is critical to its ultimate success. Program elements may need to be adjusted to reflect new information, changing market conditions, incorrect initial assumptions, or technological innovations.

### Panel Structure and Function

The Review Panel will be a five member panel created and maintained to provide on-going review of all renewable distributed generation program modifications and to efficiently facilitate incorporation of features that increase program efficacy as more information is gained by program implementation. The panel will make recommendations to the UNS Electric Renewable Energy program management for review and potential program incorporation.

The panel make-up includes one representative from the ACC staff, two representatives from the Mohave County and/or Santa Cruz County area renewable distributed generation industry, and two representatives from UNS Electric. The industry representatives should not exceed one each from a technology type and should reflect the diversity of technologies and consumer types available in the Mohave County or Santa Cruz County areas.

No renewable distributed generation industry representative shall serve more than one four year term.

The Review Panel shall make recommendations for consideration on the following subjects:

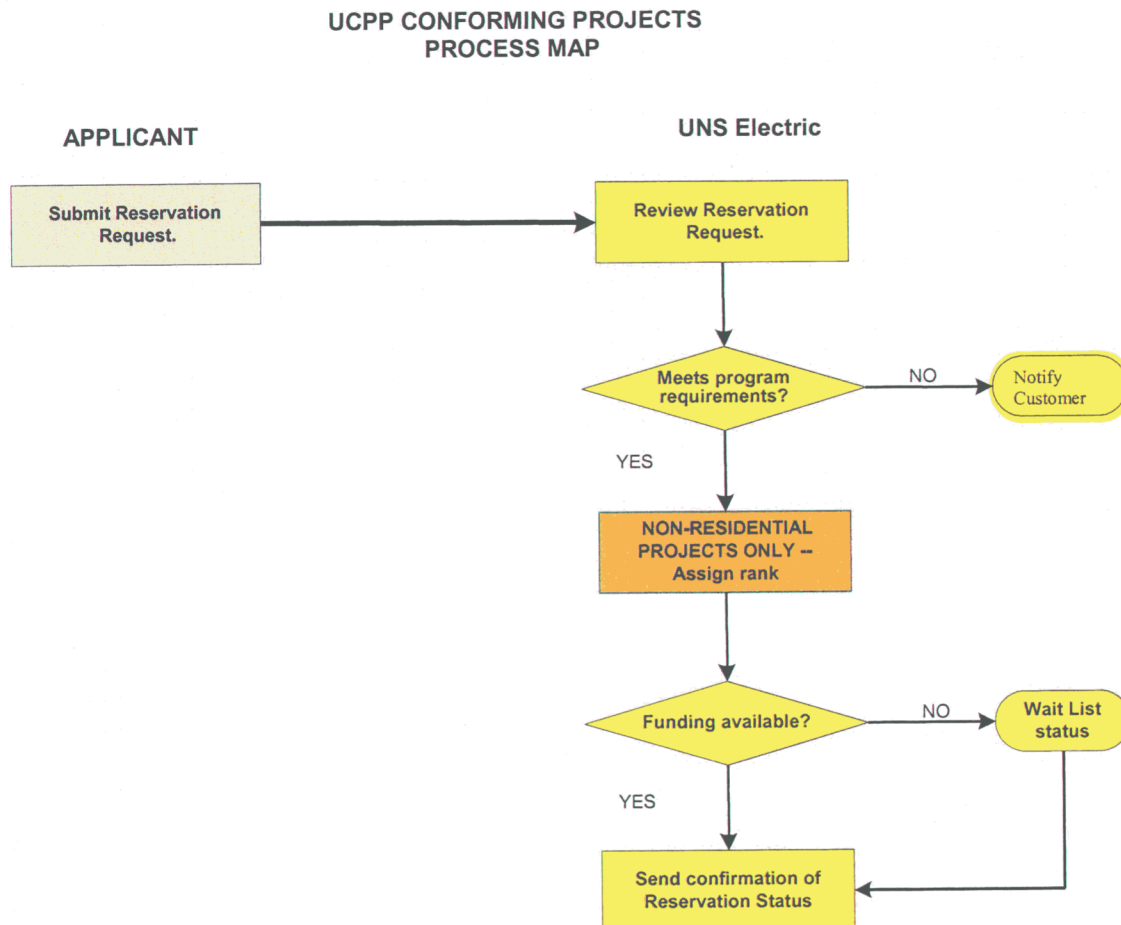
- Adjustment of incentive structures to reflect market response
- Process related issues that affect market function
- Development of new conforming incentives, as necessary
- Arbitration of incentive or program borne conflicts

The Review Panel should meet twice per year (or more often as necessary) to assess the items related to the above-described purpose. The Review Panel will review input from stakeholders on items before it for consideration, and it is anticipated that on occasion stakeholders may be consulted by the Review Panel to provide additional input. Upon full consideration of an item, the Review Panel will vote on adoption of the specified recommendation. A super-majority majority vote of at least four affirmative votes on a subject would result in a recommendation for consideration and potential incorporation into the RECPP. UNS Electric requests Commission approval of authority to implement unanimous five affirmative vote recommendations of the Review Panel without further Commission review and approval. For conditions where a unanimous vote is not achieved, the Commission will have the final approval authority.

## Process Map – Conforming Projects

UNS Electric mapped the RECPP process for conforming projects to illustrate the flow of information between the applicant and UNS Electric. The following sections reflect the recommended process flow.

### Step 1 – Reservation Request and Assignment of Reservation Status



#### Process Map Description – Step 1

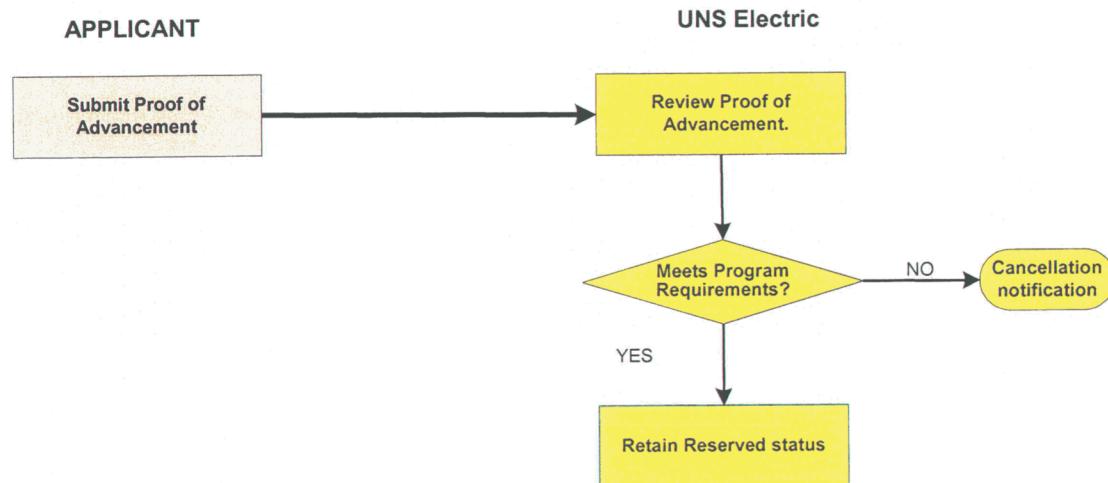
The first input UNS Electric receives from the customer is the reservation request. UNS Electric will review the reservation request to ensure the application conforms to program requirements. Residential reservation requests are processed on a first-come, first-served basis. Non-residential reservation requests are assigned a rank based on the lowest expected life cycle credit purchase cost. Additional detail on non-residential reservations is provided in the incentives section of this report.

After reviewing the reservation request, UNS Electric will assign a reservation status. If the reservation request is approved, UNS Electric will send a confirmation to the applicant. If the reservation request is denied because the request is not in compliance with program requirements, UNS Electric will send notification to the applicant of the discrepancies and that the request will be cancelled. Similarly, if the

reservation request is denied because funding is not available, UNS Electric will send a notification to the applicant that the request will be placed on a waiting list.

Residential reservation requests will be reviewed within 30 days of the utility's receipt of the request. Non-residential reservation requests will be reviewed within 90 days of UNS Electric's receipt of the request. Further detail relating to reservation periods is provided under the section titled Incentive Allocation.

### Step 2 – Proof of Advancement Process Map



#### Process Map Description – Step 2

The applicant must submit proof of advancement to UNS Electric to retain his or her reservation within the timeframes outlined below. At a minimum, the Proof of Project Advancement documentation for a non-residential application greater than 20 kWac will include:

- A project agreement (between customer and installer);
- An executed installation agreement including all project participants;
- Building and/or construction permits and/or a full set of design development or construction drawings (80% or more complete); and
- An executed interconnection agreement (if applicable).

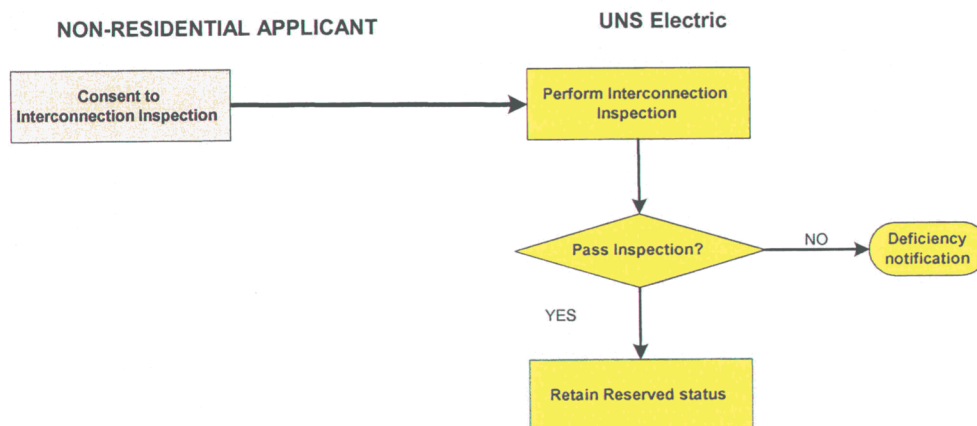
Residential customers and non-residential customers installing a renewable energy system with rated production capacity of 20 kWac or less must provide copies of City/County construction permits to UNS Electric.

The timeline for proof of project advancement is based on the date of reservation confirmation and must be provided by the customer in accordance with the following schedule:

<b>Residential</b>	<b>Non-Residential <math>\leq</math> 20,000 watts AC capacity equivalent</b>	<b>Non-Residential <math>&gt;</math> 20,000 watts AC capacity equivalent</b>
60 Days	60 Days	120 Days

If proof of project advancement is not received within the specified timeframe, the customer will be notified that the reservation is cancelled. The applicant has the option to reapply for funding after the reservation has been cancelled. The request will be processed in the same manner as a new project reservation and will be contingent upon availability of funding.

### Step 3 – Interconnection Inspection (for Grid-Tied Qualifying Systems with capacity larger than 20 kWac)

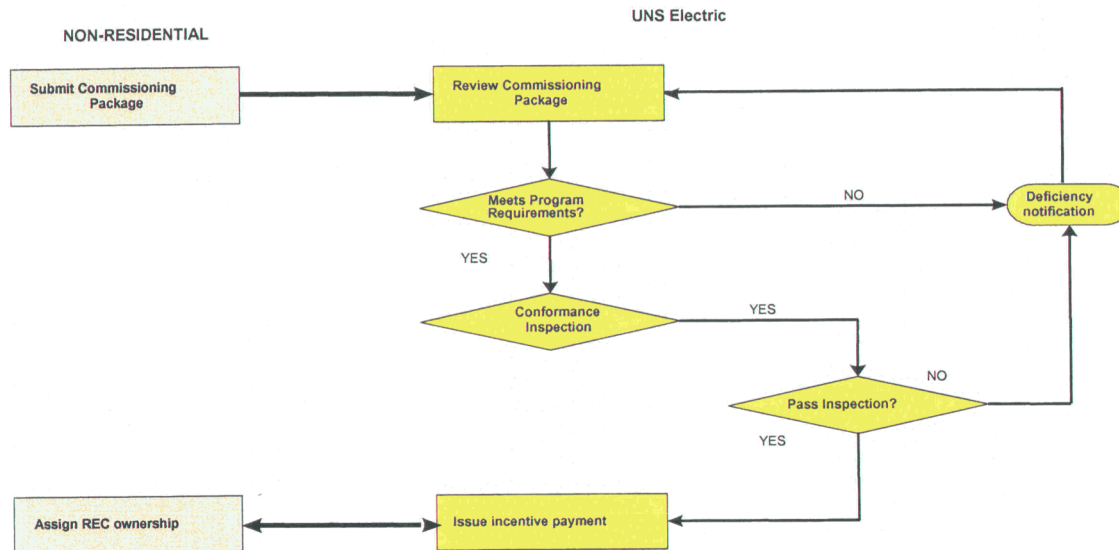


#### Process Map Description – Step 3

Non-residential grid-tied qualifying systems of electrical generating capacity larger than 20 kWac must submit to and pass an interconnection inspection before the system can be commissioned. UNS Electric conducts the interconnection inspection and will notify the applicant of the results of the inspection. If the system passes the inspection, the application retains the reservation. The applicant can keep the reservation even if the system fails the initial inspection, as long as the deficiency is remedied within the defined reservation timeframe described in Step 2.



## Step 4 – System Commissioning For Non-Residential Systems with capacity Larger Than 20 kWac



### Process Map Description for System Commissioning Non-Residential Customers – Step 4

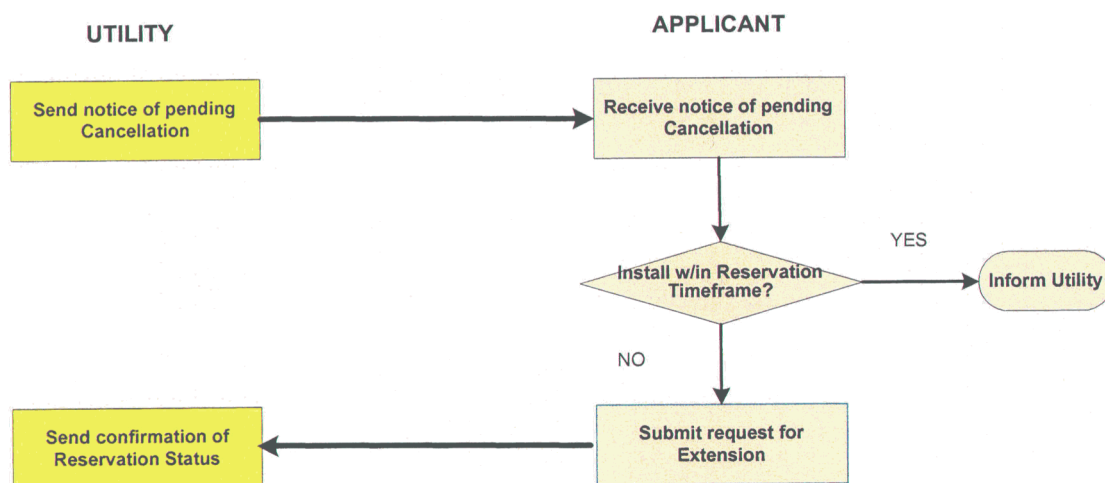
After the Non-Residential system has been commissioned, the applicant must submit a commissioning package to UNS Electric. UNS Electric will review the commissioning package and confirm that all program requirements have been met, including passing the interconnection inspection. For systems with capacity larger than 20 kWac, UNS Electric may, at its discretion, perform a conformance inspection of the system. UNS Electric will notify the applicant of the scheduled conformance inspection and the applicant must make the system available for inspection. In some cases, an incentive payment may not be issued until after a qualifying system has passed the conformance inspection.

Residential customers and non-residential customers with systems of capacity 20 kWac and less will notify UNS Electric that their installation is complete. UNS Electric will perform an acceptance test to verify installation and system performance after receiving copies of City/County permit.

Residential customers and non-residential customers with systems of capacity 20 kWac and less, who are receiving a UFI payment, and have met all program requirements, will receive the incentive payment within thirty days of successful acceptance. After UNS Electric issues the UFI payment to the applicant, UNS Electric is assigned exclusive rights to all the RECs associated with the generation produced from the qualifying system for a period of at least twenty years.

Systems receiving PBI payments will report production, receive payment, and release all RECs in conformance with the detail described in this report under the sections titled *Procedures for Production Based Incentives and Distributed Generation Incentives*.

### Conditionally Required Step - Cancellations



### Process Map Description – Cancellations

Unless an extension is granted, as described below, a reservation request will be cancelled if all program requirements have not been met with the reservation timeframe.

The reservation timeframe is determined in accordance with the following schedule:

Residential	Non-Residential $\leq$ 20,000 watts ac capacity equivalent	Non-Residential > 20,000 watts ac capacity equivalent
180 Days from Reservation Confirmation Date	180 Days from Reservation Confirmation Date	365 Days from Reservation Confirmation Date

UNS Electric will notify the applicant of the pending cancellation in accordance with the following schedule:

Residential	Non-Residential $\leq$ 20,000 watts ac capacity equivalent	Non-Residential > 20,000 watts ac capacity equivalent
30 Days Prior to Cancellation	30 Days Prior to Cancellation	60 Days Prior to Cancellation

### Extensions

UNS Electric will grant an extension for up to 90 days following timely receipt of a customer's request for extension. UNS Electric may approve written extension requests detailing the conditions for delay for periods beyond 90 days under extenuating circumstances.



## **Operations Monitoring**

All customers receiving renewable energy self-generation incentives are obligated to report system production to UNS Electric in accordance with the reporting schedule established in the program agreement between UNS Electric and the customer. UNS Electric, at its option, may perform periodic inspection of the system for operation, metered production, and reporting purposes.

## **Procedures for Production Based Incentives**

Each project eligible for a PBI requires a project agreement between the applicant(s) and UNS Electric that will detail the assignment of energy and RECs and the assignment of payment. All PBI Project Agreements will include the following requirements:

1. Meters certified according to the UNS Electric standards that provide readings in kWh will be provided by UNS Electric as part of the system commissioning package.
2. Quarterly meter reads will be performed by UNS Electric and quarterly payments will be made to the assigned payee within 30 days, based on quarterly kWh production. If the payment due is less than \$25.00, it will be held for the next payment period.
3. PBI payments will begin with the first quarterly production following receipt of the completed system commissioning package and commissioning test, if required, and continue for the life of the agreement term. As part of this provision, it is understood that systems commissioned mid-quarter will receive payment only for the production of that partial quarter.

## **Installer Qualifications**

All systems receiving incentives under the RECPP must be installed by a qualified installer. The following requirements must be submitted by the applicant as part of the reservation request. UNS Electric will verify that the installer meets the following minimum qualifications prior to confirming a reservation request:

1. The installer must possess a valid license on file with the AZROC with a license classification appropriate for the technology being installed or the installer must identify use of a contractor holding an appropriate license on file with the AZROC for the technology being installed. A copy of the AZROC license must be provided as part of the reservation request.
2. The installer must possess an Arizona business license that is active and in good standing.

Installers may request that the above information be retained on file with UNS Electric; however, under this option the installer must certify that the information on file remains current with the submission of each reservation request. Information on file must be renewed yearly.

## **Installations By Customer (Residential Photovoltaic and Wind Only)**

Residential customers may self-install photovoltaic and wind generators of capacity not to exceed 10 kWac providing they adhere to all applicable codes and standards. The customer installed systems are eligible for an incentive equal to 70% of the standard UFI, as otherwise listed in the incentive table,

Attachment D. UNS Electric reserves the right to withdraw this self-install qualification condition at any time in the future, if UNS Electric finds self-installations are not adhering to the applicable codes and standards or are found to be of poor quality workmanship.

### **Energy Reporting**

UNS Electric will report on the productivity of all RECPP distributed renewable energy resource systems within the format of the annual renewable energy Compliance Report to the ACC. For PBI systems, UNS Electric will report on the actual metered production of each system as reported by the customer and confirmed by UNS Electric. For systems receiving a UFI, UNS Electric will report on the total installed capacity and metered production.

### **System Removal**

If receiving a UFI, customer shall not remove the Qualifying System or any components thereof from the premises until December 31<sup>st</sup> of the 20<sup>th</sup> full calendar year following completion of system installation of the renewable energy system, without express agreement of UNS Electric. If receiving a PBI, customer shall not remove the Qualifying System or any components thereof from the premises until the last day of the final month of the final full calendar year of the applicable incentive payment term in the Agreement following completion of system installation of the renewable energy system, without express agreement from UNS Electric. If customer removes the Qualifying System in violation of this provision, customer shall immediately reimburse UNS Electric all incentive amounts paid by UNS Electric to customer or on behalf of customer to an authorized third party.

In addition, if a Qualified System is removed, UNS Electric shall monitor that specific customer site to ensure that an additional incentive is not provided for any new distributed renewable energy resource system on that site until the REC contracted operational life of the original system has been completed.

UNS Electric shall attempt to monitor the number of missing or non-working distributed generation systems and shall summarize its observations in its annual Compliance Report.

### **Qualifying Distributed Renewable Energy Resource Technologies – Technology Criteria**

The following technology criteria are not intended to preclude the participation of any renewable energy technology approved for implementation under the RECPP. These criteria are aimed at detailing those technologies or application segments within a technology which have been reviewed in detail by UNS Electric and were accepted as eligible conforming projects for the RECPP. In addition, the following sections provide detail on those criteria required by participating technologies.

#### General Criteria

UNS Electric acknowledges that many regulations and site specific requirements may apply to the installation of any one renewable energy technology. UNS Electric agrees that no requirement imposed by these technology criteria shall be imposed in conflict with any other governmental requirements. Any RECPP based requirement which is in conflict with a site specific governmental requirement shall be

detailed in the reservation request. All qualifying systems must adhere to the following requirements in addition to the RECPP program requirements:

- The project must comply with applicable local, state, and federal regulations.
- Products must be installed according to manufacturers' recommendations.
- Installations must meet applicable governmental statutes, codes, ordinances, and accepted engineering and installation practices.
- Systems must be permitted and inspected by the jurisdiction having authority over construction projects in the customer's locale.
- All major system components must be new and must not have been previously placed in service in any other location or for any other application.
- All renewable electricity generation systems must include a dedicated performance meter (provided by UNS Electric) which allows for measurement of system energy production. Certain other non-electric renewable energy production systems, noted below, will require customer supplied metering for PBI payment calculation purposes.
- If the qualifying system is grid-tied, the system must meet Arizona Corporation Commission Interconnection Requirements for Self-Generation Equipment.

#### Referenced standards

Some technology-specific criteria reference third party standards. The requirements of those standards are fully applicable when referenced as part of technology specific criteria. UNS Electric notes that rapid growth in national and international renewable energy programs is resulting in greater need for the development of standardization in such areas as; design, implementation, performance measurement, system integrity, and installation. UNS Electric recognizes that new standards are likely to develop in the near future for technologies included in the RECPP and recommends that the new standards are examined for application in this program definition as they become available. The following standards or standard development bodies are referenced as part of the recommended technology criteria:

- The Active Solar Heating Systems Design Manual developed by the American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) in cooperation with the Solar Energy Industries Association (SEIA) and the ACES Research and Management Foundation (the Design Manual).
- Arizona State Boiler Regulations (see R4-13-406).
- The select technology specific qualification developed by the California Energy Commission (CEC).
- Solar Rating and Certification Corporation (SRCC). The SRCC criteria and ratings can be viewed at [www.solar-rating.org](http://www.solar-rating.org).
- The Underwriters Laboratory (UL).
- IEEE -929 standard for utility interconnection of PV systems

## Technology Specific Criteria

The following equipment qualifications listed are mandatory requirements which must be met at the time of project commissioning to receive a RECPP incentive. The installation guidance is intended to provide consumers with information on installation and operation practices which are most likely to support achieving the system's designed output. Installation guidance is mandated in order for a project to receive a RECPP incentive, as it does reflect both industry and UNS Electric concurrence on those practices which are important for a technology to best achieve the designed output. In the future, additional installation guidance items may be considered for inclusion as part of the equipment qualifications.

### **Biomass/Biogas, Hydro or Geothermal Electric**

#### Equipment Qualifications

- Biomass/Biogas, Hydro or Geothermal system installations involving a regulated boiler or pressure vessel are required to comply with all Arizona state boiler regulations; provide a qualifying boiler inspection identification number; and keep all applicable permits in good standing.
- System must include a dedicated performance meter to allow for monitoring of the amount of electricity produced.
- Pre-operational/or pre-commissioning energy savings and design output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a qualified registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
- The system will have a material and labor warranty of at least five years.
- The system must meet Arizona DEQ environmental standards.

#### Installation Guidance

Because of the individual nature of biomass/biogas hydro or geothermal systems, care should be taken to make sure the system complies with all applicable permitting and regulatory requirements including, but not limited to, air emission standards and air permit regulations.

### **Biomass/Biogas or Geothermal Space Heating, Process Heating or Space Cooling**

#### Equipment Qualifications

- Biomass/Biogas or geothermal system installations involving a regulated boiler or pressure vessel are required to comply with all Arizona state boiler regulations; provide a qualifying boiler inspection identification number; and keep all applicable permits in good standing.
- Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer. The engineering

report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.

- System must include a dedicated performance meter to allow for monitoring of the amount of useful cooling produced. As an exception to the REST Rule R14-2-1803.B, energy production will be calculated at one kW-hr per ton of metered cooling for systems with capacity of 100 tons or less and one kW-hr per 1.33 tons for systems with a capacity of greater than 100 tons.
- Energy production for space heating and process heating will be calculated as one kWh of energy per 3,415 Btu of useful heat delivered by the system and used by the building space or process.
- The system will have a material and labor warranty of at least five years.
- The system must meet Arizona DEQ environmental standards.

#### Installation Guidance

Because of the individual nature of biomass/biogas or geothermal systems, care should be taken to make sure the system complies with all applicable permitting and regulatory requirements including, but not limited to air emission standards and air permit regulations.

### **Solar Non-residential Daylighting**

#### Equipment Qualifications

All systems shall include the following components as part of the daylighting system:

- A roof mounted skylight assembly with a dome having a minimum 70% solar transmittance.
- A reflective light well to the interior ceiling or a minimum 12" below roof deck in open bay areas.
- An interior diffusion lens.
- A minimum of one thermal break/dead air space in the system between the skylight dome and the interior diffuser.
- If artificial lighting systems remain a part of the installation, the system shall include automated lighting control(s) which are programmed to keep electric lights off during daylight hours of sufficient solar insolation to provide minimum design illumination levels.
- The system must provide a minimum of 70% of the light output of the artificial lighting system which would otherwise be used for all of the claimed period of energy savings as measured in foot-candles in the workspace 36 inches above the floor.
- Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer or accredited AEE Measurement and Verification professional. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
- The system will have a material and labor warranty of at least five years.

### Installation Guidance

All systems should be installed such that the skylight dome is substantially unshaded and have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.

### **Small Wind Generator**

A small wind generator is a system with a nameplate capacity rating of one MW or less. The technology criteria described below are intended for small wind generators with a nameplate rating of 100 kW or less. Larger systems will be required to submit a detailed package describing site selection, energy production modeling, and an engineered system design and installation report.

### Equipment Qualifications

- Eligible small wind systems must be certified and nameplate rated by the CEC<sup>1</sup>. See [www.consumerenergycenter.org/erprebate/equipment.html](http://www.consumerenergycenter.org/erprebate/equipment.html) for a list of certified generators. For grid tied or off-grid wind generators where an inverter is used, the CEC listed nameplate rating of the wind generator will be multiplied by the CEC approved weighted efficiency percentage listed for the inverter in the "List of Eligible Inverters" at [www.consumerenergycenter.org/cgi-bin/eligible\\_inverters.cgi](http://www.consumerenergycenter.org/cgi-bin/eligible_inverters.cgi) to calculate the wind turbine nameplate rating for use in determining the UFI payment.
- Grid connected inverters used as part of the system shall carry a UL listing certifying full compliance with Underwriter's Laboratory ("UL")-1741
- A system must include a dedicated performance meter (provided by UNS Electric) installed to allow for measurement of the amount of electricity produced.
- The performance meter and utility disconnect for grid tied systems will be installed in a location readily accessible by UNS Electric during normal business hours.
- Off-grid systems of capacity less than 10 kWac will not be metered. Compliance reporting production will be based on an annual 20% capacity factor.
- The tower used in the installation must be designed by an Arizona registered engineer and must be suitable for use with the wind generator. Tower installation must be designed and supervised by individuals familiar with local geotechnical conditions.
- To receive a UFI, the wind generator and system must be covered by a manufacturer's warranty of at least ten years. Otherwise the system will qualify for a PBI. In all cases the wind system will have a material and labor warrantee of at least five years.

### Installation Guidance

- Location: a wind turbine hub should be at least 20 feet above any surrounding object and at least 28 feet above the ground within a 250-foot radius. Wind generators should be installed in locations with an elevation at or above the general elevation of the surrounding terrain.

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<sup>1</sup> UNS Electric recommends review of the SWCC standards for rating small wind generators once they become available for purposes of supplanting the CEC requirement in this Technology Criterion.

- Lot Size: should be one-half acre at minimum. Municipalities and public facilities such as schools and libraries are exempt from the minimum lot size requirements.
- The proposed system for which application is made should be demonstrated by support information to obtain at least a 15% annual capacity factor. The following are readily available methods for helping to demonstrate the potential for a 15% capacity factor, but other methods may be used. The installation location should have a demonstrated average annual wind speed of at least 10 MPH as measured at a height of no more than 50 feet above the ground. Average annual wind speed can be demonstrated by wind speed records from an airport, weather station, or university within 20 miles of the proposed wind generator location, or by a 50 meter wind power density classification of Class 2 "Marginal" or higher on the State of Arizona Average Annual Wind Resource Map dated July 16, 2005, or later as published by Sustainable Energy Solutions of Northern Arizona University. Northern Arizona University provides detailed wind resource maps as well as other resource services. For more information contact Northern Arizona University at <http://wind.nau.edu/maps/>.

## **Photovoltaic Systems**

### Equipment Qualifications

#### *All Systems*

- All systems shall be installed with a horizontal tilt angle between 10 degrees and 60 degrees, and an azimuth angle of +/- 100 degrees of due south. Installation configurations for some systems receiving a UFI will not be eligible for the full RECPP incentive. The reduction will be determined by the UNS Electric developed de-rating chart, Attachment B of this document, and as discussed further in this report under the section titled Conforming Project Incentives.
- A system must include a dedicated performance meter (on grid tied systems, supplied by UNS Electric) to allow for monitoring of the amount of electricity produced.
- Qualifying systems using Building Integrated Photovoltaic (BIPV) modules of total array capacity of 5 kWdc or less shall receive 90% of the UFI incentive value for PV systems listed in Attachment A. Systems using BIPV module of total array capacity of greater than 5 kWDC shall only receive a PBI.
- Photovoltaic modules must be covered by a manufacturer's warranty of at least 20 years.
- Inverters must be covered by a manufacturer's warranty of at least ten years to receive a UFI and at least five years to receive a PBI.

#### *Grid-Connected Systems*

- The minimum PV array size shall be no less than 1,200 Wdc
- All photovoltaic modules must be certified by a nationally recognized testing laboratory as meeting the requirements of UL Standard 1703.
- All other electrical components must be UL listed.

- The inverter must be certified as meeting the requirements of IEEE-1547 - Recommended Practice for Utility Interface of Photovoltaic Systems and it must be UL 1741 certified.
- The utility meter, inverter, and utility disconnect will be installed in a location readily accessible by UNS Electric during normal business hours.
- Systems shall meet the requirements of Attachment A or Attachment C as appropriate.

#### *Off-Grid Systems*

- The minimum PV array size shall be no less than 600 Wdc and the maximum PV array size shall not exceed 2,000 Wdc.
- All photovoltaic modules must be certified by a nationally recognized testing laboratory as meeting the requirements of UL 1703.
- Off-grid systems will not be metered. Compliance reporting production will be based on an annual 20% capacity factor using nameplate DC rating for capacity.
- All other electrical components must be UL listed.

#### Installation Guidance

The Customer will be directed to the following resources to gain information regarding industry reference documents for system installation and performance forecasting:

The California Energy Commission's Guide to Buying a Photovoltaic Solar Electric System at [http://energy.ca.gov/reports/2003-03-11\\_500-03-014F.PDF](http://energy.ca.gov/reports/2003-03-11_500-03-014F.PDF)

The Arizona Consumers Guide to Buying a Solar Electric System at [www.azsolarcenter.com/design/azguide-1.pdf](http://www.azsolarcenter.com/design/azguide-1.pdf)

#### **Solar Space Cooling**

#### Equipment Qualifications

- The minimum cooling capacity of the system will be 120,000 BTU (10 tons) per hour.
- Solar collector panels used will have a Solar Rating and Certification Corporation ("SRCC") OG-100 rating or laboratory documentation showing the panel energy output under controlled and replicable test conditions.
- Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
- System must include a dedicated performance meter to allow for monitoring of the amount of useful cooling produced. As an exception to the REST Rule R14-2-1803.B, energy production



will be calculated at one kW-hr per ton of metered cooling for systems with capacity of 100 tons or less and one kW-hr per 1.33 tons for systems with a capacity of greater than 100 tons.

- The system will have a material and labor warranty of at least five years.

#### Installation Guidance

- The horizontal tilt angle of the collector panels should be between 20 and 60 degrees and an azimuth angle should be between +/- 45 degrees of south.
- All systems should be installed such that the energy collection system is substantially unshaded and should have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.
- The system installation should comply with the design manual.

### **Non-residential Solar Water Heating and Space Heating**

#### Equipment Qualifications

- Solar collector panels used will have a SRCC OG-100 certification or laboratory documentation showing the panel energy output under controlled and replicable test conditions.
- If annual energy production is expected to exceed 10,000 kWh or equivalent, the system must include a dedicated performance customer supplied meter to allow for monitoring of the amount of useful heat produced. Otherwise, compliance reporting production will be based on the design energy savings submitted at time of application.
- Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
- The solar collector, heat exchangers and storage elements shall have an equipment warranty of at least 10 years to qualify for a UFI and at least five years to qualify for a PBI
- The system will in all cases have a material and full labor warranty of at least five years.

#### Installation Guidance

- The horizontal tilt angle of the collector panels should be between 20 and 60 degrees (30 and 60 degrees for space heating applications) and an azimuth angle +/- 45 degrees of south.
- All systems should be installed such that the energy collection system is substantially unshaded and should have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.
- The system installation should comply with the design manual.

## Small Domestic Solar Water Heating and Space Heating

### Equipment Qualifications

- Domestic Solar Water Heating systems will be rated by the SRCC and meet the OG-300 system standard. Systems that include OG-100 collectors, but are not certified under OG-300, will need to be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer detailing annual energy savings. Solar Space Heating systems will utilize OG-100 collectors.
- Domestic Water Heating systems shall be selected and sized according to the geographic location and hot water needs of the specific application. Reservation requests will include a manufacturer's verification disclosing that the system size and collector type proposed is appropriate for the specific application, including certification that collector stagnation temperature shall never exceed 300 degrees Fahrenheit under any possible conditions at the location of the installation. The manufacturer's verification may be presented as a manufacturer's product specification sheet and will be included in the reservation request. Compliance reporting production will be based on the design energy savings submitted at time of application
- Solar Space Heating systems will be sized in conformance with the Solar Space Heating Incentive Calculation Procedure (Attachment E.) Compliance reporting production will be based on the design energy savings submitted at time of application
- Active, open-loop systems are not eligible for RECPP incentives except for active, open-loop systems that have a proven technology or design that limits scaling and internal corrosion of system piping, and includes appropriate automatic methods for freeze protection and prevents stagnations temperatures that exceed 250 degrees F. under all conditions at the location of installation. Details disclosing conformance with this exception shall be submitted as part of the manufacturer's verification documentation.
- Integrated Collector System (ICS) systems shall have a minimum collector piping wall thickness of 0.058 inches. Details disclosing conformance with this requirement shall be submitted as part of the manufacturer's verification documentation. ICS units shall include certification that collector stagnation temperature shall never exceed 250 degrees F. under any possible conditions at the location of the installation.
- The 'high' limit on all Domestic Water Heating controllers shall be set no higher than 160 degrees F.
- Active thermal storage for solar space heating systems shall use water as the storage element.
- Contractors must provide a minimum of a five year equipment warranty as provided by the system manufacturer, including a minimum warranty period of five years for repair/replacement service to the customer.
- Domestic Water Heating systems that are installed as an addition to an existing system or are submitted as a customer designed system or not certified to OG-300 must be specifically reviewed and approved by the utility.
- The solar collector, heat exchangers and storage elements shall have an equipment warranty of at least 10 years to qualify for a UFI and at least five years to qualify for a PBI.

### Installation Guidance

- The system shall be installed with a horizontal tilt angle between 20 degrees and 60 degrees (40 and 60 degrees for space heating applications), and an azimuth angle of +/- 60 degrees of due south (+/- 20 degrees for space heating applications). It is recommended that collectors be positioned for optimum winter heating conditions at a minimum tilt angle of 45 degrees above horizontal, or as recommended by the manufacturer for the specific collector type and geographic location of installation.
- All systems should be installed such that the energy collection system is substantially unshaded and should have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.
- Heat exchange fluid in glycol systems should be tested, flushed and refilled with new fluid as necessary or at a minimum every five years or sooner per manufacturer's recommendations.
- It is recommended that the anode rod be checked and replaced per manufacturer's recommendations, but no less frequently than every five years.
- It is recommended that the system design include a timer, switch, or other control device on the backup element of the storage tank.
- The collectors and storage tank should be in close proximity to the backup system and house distribution system to avoid excessive pressure or temperature losses.
- It is recommended that in areas where water quality problems are reported to have reduced the expected life of a solar water heater, that a water quality test is performed for each residence to screen for materials that through interaction with the materials of the proposed solar water heating system may reduce the expected operational life of the system components. The customer should consider contacting the manufacturer to determine if warranty or operational life will be affected.
- In areas subject to snow accumulation, sufficient clearance will be provided to allow a 12" snowfall to be shed from a solar collector without shadowing any part of the collector.
- Each system shall have a comprehensive operation and maintenance manual at the customer's site, which includes a spare parts list, data sheets and flow diagrams indicating operating temperatures and pressures, maintenance schedules and description of testing methods and each customer must complete an initial start up and operation training review with the contractor at the time of system start up.
- Ball valves shall be used throughout the system. Gate valves shall not be used.
- Pipes carrying heated fluids shall be insulated for thermal energy conservation as well as personnel protection.

### **Technologies without Technology Specific Criteria and Non-Conforming Projects**

Technology specific criteria have not yet been developed for the following qualifying technologies:

- Fuel Cells
- Non-Residential Pool Heating

For applicants requesting incentives for the above technologies or for applicants requesting installation of a technology with conforming project technology criteria, but where some criteria cannot be met, the applicant will need to submit design and output documentation.

Applicants installing these systems will, at a minimum, need to provide an energy savings and designed output report for the system. The report must include either a testing certification for a substantially similar system prepared by a publicly funded laboratory or an engineering report stamped by a qualified registered professional engineer. The engineering report and/or testing certification shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications. Additional information may be required as part of the RECPP requirements.

## **Distributed Renewable Energy Resource Incentives**

### Incentive Principles

RECPP incentives can be applied to systems designed to serve only the typical load of the customer with whom the incentive agreement has been established. The assessment of that typical load does not preclude the periodic production of electricity in excess of the customer's demand. Under some circumstances it is understood that select customer installations will be designed to serve loads greater than that of the customer. Under those circumstances, the RECPP incentive will be applied only to the fraction of the generation which is used to serve the typical customer load. Other incentives were developed separate and apart from other RECPP program incentives, such as those for demand side management projects. Systems are not eligible to receive RECPP incentives if other utility incentives are applied.

Up-front incentives (UFIs) are those incentives where the customer receives a one-time payment based on the system's designed capacity or based on the first year energy savings provided by the system. In general, this type of incentive is appropriate for smaller, 20 kWac or less, non-residential installations and all residential installations. The second incentive type is a production based incentive (PBI). The PBI allows the customer to collect incentive payments in direct relation to the actual system production. PBIs are most appropriate where the total system costs are large, of 20 kWac capacity or above.

Incentive funds can be applied to a project, which is the sum of all systems installed at a customer site in a single calendar year. A customer site is the sum of facilities and/or buildings associated with a single utility revenue meter.

A customer site can obtain a UFI for multiple projects, under separate reservations, up to 20,000 Wac capacity equivalent at each customer site. Once the sum of incentives for all project(s) exceeds the 20,000 Wac capacity equivalent limit, described below, incentives for additional projects will take the form of a PBI. This condition only applies to non-residential systems. No partial or split payment types are allowed under one project regarding a UFI or PBI.

All residential systems will be offered only a UFI, unless system warranty conditions will not qualify for a UFI in which case a PBI would apply. Residential customers will receive a UFI up to a cap of 20kWac. If a residential system is installed above 20 kWac, UNS Electric will only provide an incentive payment

for the first 20 kWac. Non-residential systems may receive either a UFI or a PBI, depending on the warranty period, technology and the installation size. UFIs were developed for technologies where the average project size results in a total single site renewable capacity equivalent installed less than or equal to 20,000 watts AC. PBIs were developed for technologies where the average project size results in a total single site installed capacity equivalent of more than 20,000 Wac. Both UFIs and PBIs were developed for technologies where projects can range in size. There is no incentive cap for non-residential systems other than annual program funding considerations.

In return for UNS Electric's payment of a UFI, UNS Electric will be given complete and irrevocable ownership of the RECs until December 31<sup>st</sup> of the 20<sup>th</sup> full calendar year after completion of installation of the system. Operational life during that time frame must be supported by system warranty or planned maintenance schedules.

UNS Electric's payment of a PBI will assure UNS Electric complete and irrevocable ownership of the REC for the full duration of the PBI agreement. The agreement duration must fully coincide with the PBI payment schedule and the system must be supported by system warranty or planned maintenance schedules for the term of the agreement.

Projects receiving a UFI can receive no more than 60% of the system cost in the total incentive payout. A PBI can not exceed 60% of the real project costs, defined as the undiscounted total system cost plus acceptable financing charges. Acceptable finance charges are finance charges used for the PBI incentive cap calculation and can not exceed the current prime interest rate plus 5%. Financing charges must be disclosed as part of the commissioning package, if not disclosed before.

It is expected that the UFI and PBI incentive caps as a percentage of system cost will decline in the third year of the program to 55%, and the caps will decline to 50% in the fifth year and beyond.

RECPP incentives in combination with other state and federal incentives make it likely that some renewable energy production systems would be free to the customer, or in the extreme, that the customer would realize a net profit from installing a system.

To prevent this result, UNS Electric requires that customers requesting incentives for these systems be required to contribute a minimum of 15 percent of the System Cost in the case of a UFI and of the Project Cost in the case of a PBI. As such, the incentive for all RECPP projects will be calculated as follows: assume the full application of all available incentives, not including the RECPP incentive, and regardless of the customer's ability to fully realize any particular incentive, add the customer contribution (15%), and finally add the RECPP incentive. If the RECPP incentive can be fully applied given the other incentive cap provisions without exceeding the System Cost in the case of a UFI or Project Cost in the case of a PBI, the customer will receive the full incentive amount. If the RECPP incentive cannot be fully applied without exceeding the System Cost in the case of a UFI or Project Cost in the case of a PBI, the RECPP incentive will be capped such as not to exceed the System Cost in the case of a UFI or the Project Cost in the case of a PBI. The incentive amount will be calculated at the time the application is approved for reservation. If federal or state incentives change during the period of time after the reservation approval, the incentive amount reserved will not be changed as long as the reservation is not cancelled.

### Conforming Project Incentives

Conforming project incentives were developed to help create or expand incipient markets for distributed renewable energy production facilities, taking into account each technology's specific market conditions, and placing a significant portion of the cost on project owners. The incentives reflect specific input from each technology representative(s). Program incentives were generally not developed with specific consideration for other available state or federal incentives. Incentive caps detailed above were relied upon to account for the impact of multiple incentive sources.

In general, PBI incentive levels were developed first by establishing an incentive for a 10-year agreement. The incentives proposed by UNS Electric are detailed in Attachment D. UNS Electric proposes that the incentive matrix in Attachment D be applied for the first five years of the RECPP. In all cases, incentive values listed in Attachment D are maximum values. Applicants are encouraged to submit applications requesting incentive amounts less than the maximums listed. Applications requesting a lower level of incentive payment than the maximum will have an increased chance of acceptance in the allocation ranking process.

UNS Electric proposes that incentive types should transition to all PBI based incentives after 2012 and incentive levels should continue to decline in future program years. In the long term, incentives should be market based. UNS Electric also recommends that the declining incentives and proposed reductions be carefully reviewed prior to implementation.

### Technologies with Special Incentive Considerations

Beyond the requirements of the technology specific criteria and the requirements of the incentive matrix, some technologies require additional project specific adjustment of the available incentives. Those specific requirements are detailed below.

#### **Photovoltaic Systems**

The productivity of photovoltaic systems is sensitive to the specifics of the installation method and location. In particular, these systems are impacted by shading, photovoltaic panel horizontal tilt angle and azimuth, and potentially regional conditions. These factors are particularly important as they relate to systems receiving UFI type incentives both in the amount of incentive received by the customer and in the computation of the capacity reported by UNS Electric.

UNS Electric has established a single incentive adjustment table clearly detailing adjustments for each allowable photovoltaic system configuration. UNS Electric will work to assure that the adjustment table is easily interpreted by consumers and installers. The incentive adjustment chart prepared by UNS Electric is included as Attachment B.

#### **Small Domestic Solar Hot Water and Space Heating Systems**

Accurately predicting appropriate incentive levels in support of system costs associated with small domestic solar hot water and space heating systems present a challenge. RECPP incentives in

combination with other state and federal incentives make it likely that some systems would be free to the customer, or in the extreme, that the customer would realize a net profit from installing a system.

To prevent this result, UNS Electric proposes that customers requesting incentives for these systems be required to contribute a minimum of 15 percent of the system cost. As such, the incentive for small domestic solar hot water and space heating systems will be calculated as follows: assume the full application of all available incentives, not including the RECPP incentive, and regardless of the customer's ability to fully realize any particular incentive, add the customer contribution (15%), and finally add the RECPP incentive. If the RECPP incentive can be fully applied without exceeding the System Cost, the customer will receive the full incentive amount. If the RECPP incentive cannot be fully applied without exceeding the System Cost, the RECPP incentive will be capped such as not to exceed the System Cost.

Example:

$$\text{RECPP Incentive} \leq (\text{System Cost}) - (\text{Total of all Incentives})$$

Where:

$$\text{Total of all Incentives} = \text{Federal Incentives} + \text{State Incentives} + (15\% \text{ Customer Contribution})$$

For purpose of UFI calculation, System Cost for a solar space heating system will not include the cost of any passive thermal storage or the cost of the building heating system itself. It will include the cost of new materials and installation of active thermal storage, expansion tanks, controls, tempering valves, piping, vents, drains, safety valves and all freeze protection.

### **Small Solar Space Heating System**

There are several additional challenges associated with Solar Space Heating Systems. Variability in design for these systems generally suggested a high level of expertise was required to appropriately size and design the systems; yet the overall system cost seemed to require a standardized approach. In order to address this challenge, UNS Electric has adopted a standardized calculation method to support system sizing and incentive payment. The display page of the spreadsheet calculation is presented in Attachment E.

The solar space heating incentive calculation does not suggest or imply that a full energy audit is required to qualify for the solar space heating incentive. The intent is that industry professionals can utilize the calculation tool to aid in facilitating sound system design.

The effective use of the solar space heating incentive calculation is contingent on a Building Design Review. The Building Design Review calculations, inputs and outputs will be determined and specified as part of the reservation request. It is noted that stakeholder acceptance of the proposed calculation tool is conditioned on the future development of standardized design tools, potentially including input tables and charts.

UNS Electric believes that the proposed approach reflects sound design principles and uses inputs which should be available to professionals in this industry segment. UNS Electric does, however, recognize that the approach used in the standardized calculation is not currently universally applied. UNS Electric proposes that continuing efforts be made to develop standard input charts and tables to increase the efficiency of the method's application. In addition, it is the expectation of UNS Electric that the standard calculation can, in most instances, be implemented by practitioners in the solar space heating industry. UNS Electric supports industry collaborative efforts to increase technical knowledge development in this specific area.

### **RECPP Incentive Allocation**

UNS Electric identified two primary program level allocations in conjunction with the RECPP. The first allocation is that associated with RECPP conforming projects. The second is that associated with RECPP non-conforming Projects.

#### Conforming Project Incentive Allocation

Beyond the allocation made by UNS Electric for purposes of funding conforming projects, UNS Electric also recommends an allocation framework within the conforming project allocation. UNS Electric designed the allocation framework with several key considerations in mind. The factors considered in developing project incentive allocations were as follows:

- Administrative ease
- Economic efficiency
- Consumer clarity and ease of understanding
- Establishment of a high degree of market certainty
- Encouragement of cost reductions in renewable energy technologies
- Flexibility sufficient to allow timely adaptations to changing market conditions
- Capability for making funds available in a timely manner, and
- Avoidance of excessive incentives

These considerations resulted in two different allocation frameworks, one for residential projects and one for non-residential projects. The allocation frameworks are described below.

#### Conforming Projects – Residential Incentive Allocation – 95% of Distributed Generation funds in 2008.

Funds for conforming residential projects will be divided into four quarters (Jan-Mar, Apr-Jun, Jul-Sep, and Oct-Dec). Funds within each quarter will be made available weekly for reservations on a first-come, first-served basis. However, applications received during a given week that request incentive funding levels below the maximum incentive values will receive priority for the allocation of funds available that week based on the lowest expected life cycle credit purchase cost as provided in the application and verified by UNS Electric. Reservation requests can be made throughout each quarter and will be



reviewed and approved by the utility weekly as long as the quarterly funding has not been exhausted, assuming all other program requirements have been met.

Funds unused in one quarter will be equally divided among the remaining quarters in that year. Funds allocated to residential projects will not roll forward from one year to the next. If funds in one quarter are fully exhausted, funds for the following quarter will be made available at the start of the following quarter.

Reservations which are rejected as a result of insufficient funds will be offered the opportunity to retain their original reservation date for one additional quarter without the need to resubmit application documentation. If the incentive level has changed from the date of the original reservation to the date when the reservation is approved, the new incentive level shall be applied.

#### Conforming Projects – Non-residential Incentive Allocation – 5% of Distributed Generation Funds in 2008.

The non-residential incentive allocation framework allows market forces to play a major deciding role in the selection of projects when the volume of proposed projects exceeds the budget for non-residential projects. When the volume of proposed projects is relatively small so that the non-residential program is not fully subscribed, all conforming projects would be selected. In addition, a yearly review will be made to observe and review trends in requested and approved incentive levels. UNS Electric believes this element is important for the on-going management and potential adjustment of incentive levels as needed to respond to market conditions.

Non-residential funds will be equally divided into four quarters (Jan-Mar, Apr-Jun, Jul-Sep, and Oct-Dec). Funds within each period will be made available to projects based on a ranking generated by lowest expected life cycle credit purchase cost as provided in the application and verified by UNS Electric. In the event of a tie in the ranking, when the program would be fully subscribed if both projects were given reservation status, funds will be awarded based on the date of receipt of the completed reservation request.

In each three-month period, reservation requests will be accepted, but they will be reviewed by the utility only after the conclusion of the three month period. Once reservation requests are fully ranked in each reservation period, notification of reservation approvals and rejections will be made in conformance with the rankings and available funding.

Funds unused in one period will be equally divided among the remaining periods in that year. Funds allocated to non-residential projects will not roll forward from one year to the next. Reservations which are rejected as a result of insufficient program funds may elect to carry forward into the next period and retain the original reservation date. The election must be made at the time of the original application.

Within each period, projects submitted to the utility for reservation will be ranked based on a calculated index value for purposes of allocating non-residential funds as proposed in the application and verified by UNS Electric. Lowest lifecycle cost projects will be funded first. Indexing of the non-residential projects will be performed based on the verified incentive values and terms in the application for that project. Projects with higher incentive payments result in a higher expected life cycle credit purchase cost and projects that produce more kWh result in a lower expected life cycle credit purchase cost.

## **Conforming Projects Fund Contributions Between Residential and Non Residential**

Available funding will be split between residential and non-residential project classes. Initially 5% is being allocated to non residential system incentives and 95% is being allocated to residential system incentives. This split will be reapplied each quarter if all funds are not reserved.

### **Non-Conforming Projects – Allocation: 0% of Distributed Generation Funds in 2008.**

Non-conforming projects include, but are not limited to, projects with staged completion dates, multi-customer or multi-system projects, projects involving more than one technology where an interrelated incentive was not developed, projects requiring new or unique agreement terms, or projects requiring timelines differing from those offered to conforming projects. Non-conforming projects also include technologies for which a conforming incentive or technical qualifications were not developed at the time of this plan.

As detailed in the RECPP incentive allocation section of this plan, UNS Electric will disclose the allocation of funds for non-conforming projects in its implementation plan for the next year. UNS Electric will generally, but not always, include a minimum allocation to allow for the potential development of projects with technologies not included on the conforming project incentive matrix.

UNS Electric will apply a minimum of 50% and a maximum of 75% of the non-reserved, non-conforming project allocation to conforming project funding at the end of each calendar quarter. Unreserved non-conforming project allocations will not carry forward from one year to the next.

Incentives used for non-conforming projects must achieve similar economic efficiency as those incentives used in the conforming project category. Incentives applied for non-conforming projects must meet the lower of: 1) the maximum allowable incentive for the proposed technology as described in Attachment D, or 2) the average incentive value of projects accepted by UNS Electric for incentive disbursement for the proposed technology in the previous year.

Some qualifying technologies will not meet either of the previously described economic efficiency measures. Those applicants can negotiate the requested system or project incentive with UNS Electric. In no instance can the incentive exceed the highest calculated appropriate incentive payment value for projects approved by UNS Electric in the previous year.

Under some circumstances a non-conforming project may not identify the customer at project initiation. Regardless of the project design, implementation, or timeline, a customer must be identified at the time of system commissioning. Non-conforming funds will be disbursed upon filing by the customer and acceptance of project commissioning documentation by UNS Electric. For purposes of financing non-conforming projects, funds can be assigned to third parties.

Non-conforming systems must report system capacity (for up-front incentives) or production (for performance-based incentives) in general conformance with those same technologies as described in the conforming project requirements and be covered by similar warranties. For those technologies not described in the conforming project criteria, the reservation documentation must include details related to

warranty, system capacity and anticipated annual production. Metering equipment must be made available to UNS Electric during normal business hours for inspection and reporting purposes.

Initially, no funding would be allocated to the Non-Conforming Project class. However, if Non-Conforming Project applications are received, unused funds from the Conforming Project Classes may be allocated to the Non-Conforming Project class. Alternatively, if sufficient interest in developing Non-Conforming Projects is demonstrated, they could be accepted into the Conforming Project class after development and acceptance of technical standards and appropriate incentive values; or UNS Electric could request a special project fund allocation for a specific Non-Conforming Project in its annual REST Tariff Adjustor Mechanism and Implementation Plan filing.

Application Process  
ATTACHMENT A

System Qualifications

All solar electric generating Customer Systems must meet the following system and installation requirements to qualify for Tucson Electric Power Company's ("UNS Electric" or the "Company") GreenWatts™ SunShare Hardware Buydown Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Hardware Buydown Agreement.

1. A Residential Customer System must have a total solar array nameplate rating of at least 1,200 watts DC and no more than 30,000 watts DC. Any Non-Residential Customer System must have a total solar array nameplate rating of more than 1,200 watts DC.
2. The Customer System components must be certified as meeting the requirements of IEEE-929 - Recommended Practice for Utility Interface of Photovoltaic Systems.
3. The Customer System components must be certified as meeting the requirements of UL-1741 - Power Conditioning Units for use in Residential Photovoltaic Power and be covered by a non-prorated manufacturer's warranty of at least two years.
4. Photovoltaic components must be certified as meeting the requirements of UL-1703 - Standard for Flat Plate Photovoltaic Modules and Panels Systems and be covered by a non-prorated manufacturer's warranty of at least 20 years.
5. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code, including Article 690 and all grounding, conductor, raceway, over-current protection, disconnect and labeling requirements.
6. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code in effect in the jurisdiction where the installation is being completed (NEC), including, without limitation, Sections 200-6, 210-6, 230-70, 240-3, 250-26, 250-50, 250-122, all of Article 690 pertaining to Solar Photovoltaic Systems, thereof, all as amended and superseded.
7. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
8. The Customer System installation must meet the UNS Electric Service Requirements as follows:

"An AC disconnect means shall be provided in an area accessible at all times to the Company on all ungrounded AC conductors and shall consist of a lockable gang operated disconnect clearly

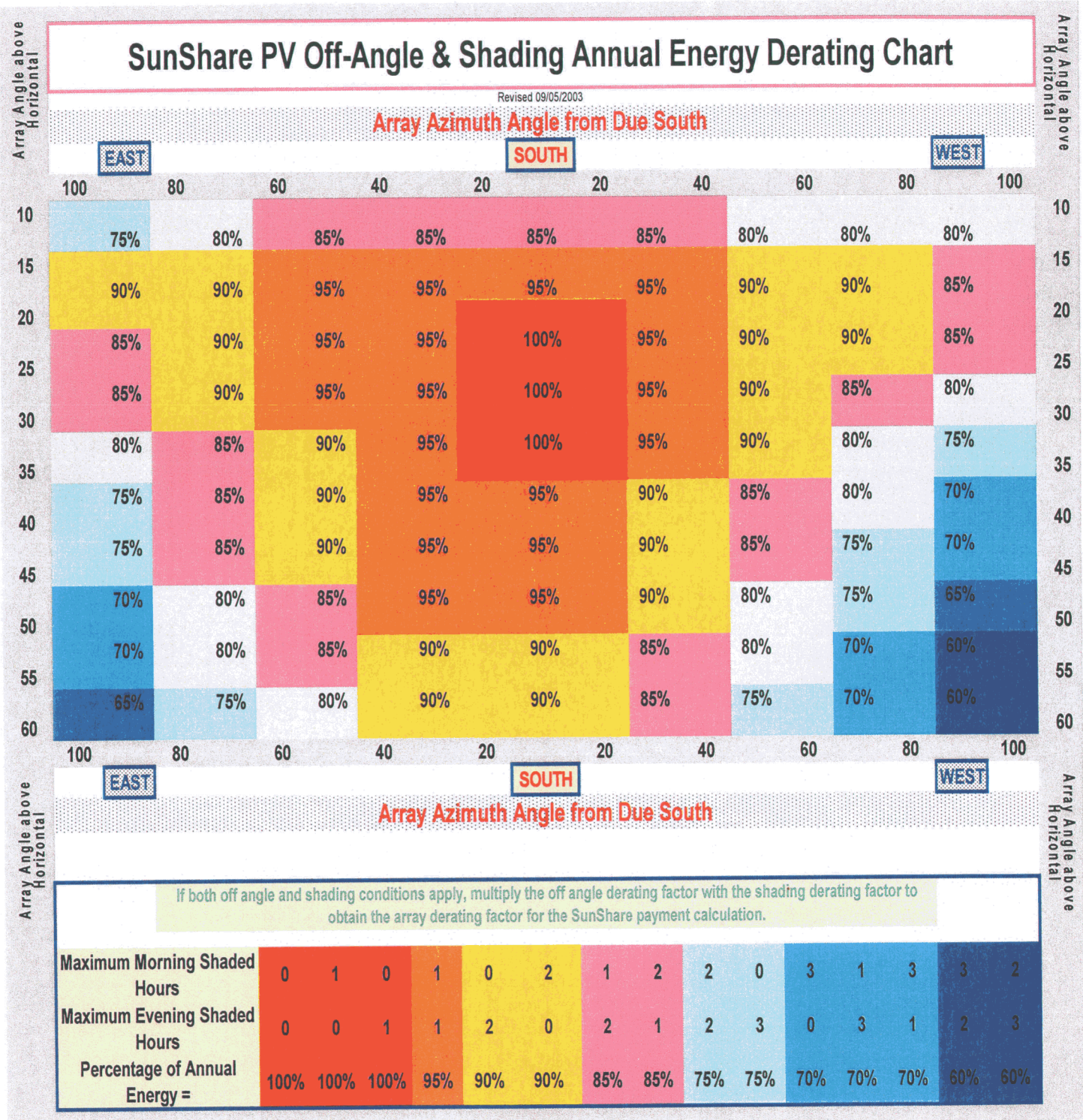
indicating open or closed. The switch shall be visually inspected to determine that it is open. The switch shall be clearly labeled "DG SERVICE DISCONNECT."

9. The Customer System photovoltaic panels and modules must face within +/- 100 degrees of real south, and be completely unshaded from three hours after sunrise to three hours before sunset. System arrays which are facing at an azimuth angle of more than 20 degrees from true south or shaded for more than one hour per day will be subject to a reduced amount of buydown payment per Attachment B.
10. The Customer System photovoltaic panels and modules must be fitted at an angle of 10 degrees to 60 degrees from horizontal. System arrays which are fitted with an elevation angle of less than 20 degrees or more than 35 degrees above horizontal will be subject to a reduced amount of buydown payment per Attachment B.
11. For Residential Customer Systems, Company will provide a meter and meter socket that will be installed in a readily accessible outdoor location by the Customer between the DC to AC converter and the connection to the over-current device in the Customer's electric service panel. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the DC to AC converter and the connection to the over-current device in the Customer's electric service panel.
12. Storage Batteries are not allowed as part of the Customer System unless the inverter is a separate component and UNS Electric can locate the Solar Meter at the inverter's output. If configured otherwise, battery losses will adversely reflect in the annual AC metered energy output. Customer's solar energy generation and energy storage system must meet the requirements of 2 and 3 of this Attachment A.
13. Installation must have been made after January 1, 1997.
14. The Customer must be connected to the Company's electric grid, except for approved off-grid systems in conformance with the RECPP.
15. The DC to AC inverter used must provide maximum power point tracking for the full voltage and current range expected from the photovoltaic panels used and the temperature and solar insolation conditions expected in Mohave County or Santa Cruz County, Arizona.
16. The DC to AC inverter must be capable of adjusting to "sun splash" from all possible combinations of cloud fringe effects without interruption of electric production.
17. All Customer System installations must be completed in a professional, workmanlike and safe manner.
18. Total voltage drop on the DC and AC wiring from the furthest PV module to the AC meter will not exceed 2%.

19. PV panels and DC to AC inverter will be installed with sufficient clearance to allow for proper ventilation and cooling. At a minimum, manufacturer clearance recommendations will be observed. In no case will PV modules be mounted less than 4 inches above any surface and an additional inch of clearance for each foot of continuous array surface beyond four feet in the direction parallel to the mounting support surface.



# **ATTACHMENT B** **SunShare PV Off-Angle & Shading Annual Energy Derating Chart**



**ATTACHMENT C**  
**Supplemental Non-Residential System Qualifications**  
**(Applicable Only for Customer Systems of Capacity Larger than 20,000 watts AC)**

1. All solar electric generating Non-Residential Customer Systems must meet the following additional system and installation requirements to qualify for UniSource Electric's ("UNS Electric" or the "Company") GreenWatts™ SunShare Hardware Buydown Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Hardware Buydown Agreement.
2. The Non-Residential Customer System shall be operating, substantially complete and have produced an AC output at least 70% of the total array nameplate DC rating at PTC as described below.
3. Operation, Maintenance and Repair. The Customer shall be solely responsible for the operation, maintenance and repair of the Non-Residential Customer System and any and all costs and expenses associated therewith. Company will notify Customer of all Non-Residential Customer System repairs the Company determines are reasonably necessary to support proper continued electrical production of the Non-Residential Customer System. The Customer will notify the Company within five (5) business days of its receipt of any such Company repair notice if the repair requires the installation of a new inverter and/or PV module. The Customer shall complete any such repair that affects the Non-Residential Customer System performance and does not require the purchase of a new inverter or PV module(s) within five (5) business days of the Company's notice of the need for such repair. For any such repair that does require the purchase and installation of a new inverter and/or PV module, the Customer shall promptly commence and diligently pursue such repair to completion, provided, in no event shall such repair take more than thirty (30) days to complete. At all times while Company is receiving the environmental credits from the Non-Residential Customer System, Customer shall clean all PV modules in the Non-Residential Customer System as necessary to keep them free from foreign material that would visibly obscure the modules, including any dirt and/or oils.
4. Non-Residential Customer System Security. At all times during and after installation of the Non-Residential Customer System, the Customer shall use commercially reasonable efforts to provide adequate security to prevent damage or vandalism to the Non-Residential Customer System.
5. Company shall provide Customer with a revenue grade AC meter to be installed between the Non-Residential Customer System and the grid interconnection. This meter will not be used for billing, but shall be used for any official Non-Residential Customer System production output data. Company will retain ownership of the meter and be responsible for its repair if needed.
6. The utility interactive solar generation Non-Residential Customer System shall deliver an AC output in AC watts at least equal to 70% of the total array nameplate rating in DC watts as measured at performance test conditions (PTC) of 1000 watts/m<sup>2</sup> irradiance, 68 degrees F. ambient temperature and a maximum of a 2.4 mph wind speed. The Customer will verify performance of



the system with a 30 day test using a temporary data monitor and acquisition system or make a single point measurement to determine the output of the system.

7. The Customer shall verify and demonstrate to Company the proper calibration and operation, through a temporary data monitor and acquisition system, of the solar insolation sensor, the ambient temperature sensor, the wind speed sensor and the AC power meter within +/- 2% of Company independent sensor data. If performance test data is not available at PTC, the indicated AC power output of the Non-Residential Customer System will be corrected to PTC by the following formula:

$$\text{Power(PTC)} = ((\text{Power(Meter)} * (1000 / \text{SolarSensor(W/M}^2))) * (1 + (((\text{AmbientTempSensor(DegF)}) - 68) * 0.0026)))$$

(On the condition that data used in the formula is taken on a cloudless day at a solar insolation of at least 950 watts per square meter and wind speed is less than 2.4 mph)

8. Company shall have the right to challenge the accurate calibration of the sensors and temporary data monitor and acquisition system with proper documentation demonstrating the reasons for the challenge. The Customer shall resolve the challenged sensor or temporary data monitor and acquisition system calibration to the satisfaction of Company prior to the data being used in the performance test being recorded.
9. Customer shall provide Company with no less than ten (10) days prior notice of any planned Customer tests to the Non-Residential Customer System. Company shall have the right to be present at any and all tests of the Non-Residential Customer System. The Customer shall provide Company notice as soon as the Non-Residential Customer System has been installed and has passed all Customer tests.
10. Customer shall provide Company with all documentation reasonably requested by Company to demonstrate to the Commission that any environmental credits transferred under the Agreement were derived from an eligible technology, that the kWh generated are accurately reported and that the environmental credits have not expired or been used by any other entity for any purpose.
11. If certified proof can not be provided of complete galvanic isolation of any and all DC from the AC output of the inverter(s) used in the Non-Residential Customer System through IEEE-1547 certification of the inverter, the Non-Residential Customer System shall include an isolation transformer installed between the inverter(s) and the grid interconnection. The transformer will be rated at full load continuous operation at 50 degrees C. at 125% of nameplate DC array rating and have an efficiency rating at nameplate DC array rating power of at least 98% as tested. The transformer will have at least one tap each of 2.5% and 5% both above and below the nominal voltage tap.

## ATTACHMENT D

### RECPP – CONFORMING PROJECT INCENTIVE MATRIX

2008 and 2009 Program Year

Technology/Application	UP FRONT INCENTIVE <sup>1</sup>	10-Year REC Agreement <sup>2</sup>	15-Year REC Agreement <sup>2</sup>	20-Year REC Agreement <sup>2</sup>
	20-Year REC Agreement	10-Year Payment (\$/kWh)	15-Year Payment (\$/kWh)	20-Year Payment (\$/kWh)
BIOMASS/BIOGAS (Electric)	NA	0.060	0.056	0.054
BIOMASS/BIOGAS – CHP (Electric) <sup>3</sup>	NA	0.035	0.032	0.031
BIOMASS/BIOGAS – CHP (Thermal) <sup>3</sup>		0.018	0.017	0.016
BIOMASS/BIOGAS (thermal)	NA	0.015	0.014	0.013
BIOMASS/BIOGAS (cooling)	NA	0.032	0.030	0.029
DAYLIGHTING (Non-Residential)	\$0.20/kWh <sup>7</sup> See this note for clarification	NA	NA	NA
GEOHERMAL – (electric)	NA	0.024	0.022	0.022
GEOHERMAL – (thermal)	1.00/Watt	0.048	0.045	0.043
GEOHERMAL – (cooling)	NA	0.032	0.030	0.029
SMALL HYDRO	NA	0.060	0.056	0.054
SMALL WIND (grid-tied) <sup>4</sup>	\$2.50/Watt AC	0.145	0.135	0.130
SMALL WIND (off-grid) <sup>4</sup>	\$2.00/Watt AC	0.116	0.108	0.104
SOLAR ELECTRIC:				
RESIDENTIAL (GRID-TIED)	\$4.50/Watt DC <sup>8</sup>	0.202	0.187	0.180
Non-Residential (Grid-Tied) 20 kW or less	\$2.50/Watt DC <sup>8</sup>	0.202	0.187	0.180
NON-RESIDENTIAL (GRID-TIED) More than 20 kW	NA	0.202	0.187	0.180
RESIDENTIAL (OFF-GRID)	\$2.00/Watt DC <sup>8</sup>	NA	NA	NA
NON-RESIDENTIAL (OFF-GRID)	NA	0.121	0.112	0.108
SOLAR SPACE COOLING <sup>5</sup>	NA	0.129	0.120	0.115
SOLAR WATER HEATING/SPACE HEATING <sup>5</sup> (Non-Residential)	NA	0.057	0.052	0.051
RESIDENTIAL SOLAR WATER/SPACE HEATING <sup>6</sup>	\$1,500.00 plus \$0.50/kWh to a maximum of \$3,500.00 <sup>9, 10</sup>	0.057	0.052	0.051
NON-RESIDENTIAL POOL HEATING	NA	0.012	0.011	0.011

## RECPP – CONFORMING PROJECT INCENTIVE MATRIX

2010 and 2011 Program Year

Technology/Application	UP FRONT INCENTIVE <sup>1</sup>	10-Year REC Agreement <sup>2</sup>	15-Year REC Agreement <sup>2</sup>	20-Year REC Agreement <sup>2</sup>
	20-Year REC Agreement	10-Year Payment (\$/kWH)	15-Year Payment (\$/kWH)	20-Year Payment (\$/kWH)
BIOMASS/BIOGAS (Electric)	NA	0.054	0.050	0.048
BIOMASS/BIOGAS – CHP (Electric) <sup>3</sup>	NA	0.032	0.029	0.028
BIOMASS/BIOGAS – CHP (Thermal) <sup>3</sup>		0.016	0.015	0.014
BIOMASS/BIOGAS (thermal)	NA	0.014	0.013	0.012
BIOMASS/BIOGAS (cooling)	NA	0.029	0.027	0.026
DAYLIGHTING (Non-Residential)	\$0.18/kWH <sup>7</sup> See this note for clarification	NA	NA	NA
GEOTHERMAL – (electric)	NA	0.022	0.020	0.019
GEOTHERMAL – (thermal)	0.90/Watt	0.044	0.040	0.039
GEOTHERMAL – (cooling)	NA	0.029	0.027	0.026
SMALL HYDRO	NA	0.054	0.050	0.048
SMALL WIND (grid-tied) <sup>4</sup>	\$2.25/Watt AC	0.131	0.121	0.117
SMALL WIND (off-grid) <sup>4</sup>	\$1.80/Watt AC	0.105	0.097	0.094
SOLAR ELECTRIC:				
RESIDENTIAL (GRID-TIED)	\$4.00/Watt DC <sup>8</sup>	0.182	0.168	0.162
Non-Residential (Grid-Tied) 20 kW or less	\$2.25/Watt DC <sup>8</sup>	0.182	0.168	0.162
NON-RESIDENTIAL (GRID-TIED) More than 20 kW	NA	0.182	0.168	0.162
RESIDENTIAL (OFF-GRID)	\$1.80/Watt DC <sup>8</sup>	NA	NA	NA
NON-RESIDENTIAL (OFF-GRID)	NA	0.109	0.101	0.097
SOLAR SPACE COOLING <sup>5</sup>	NA	0.116	0.108	0.104
SOLAR WATER HEATING/SPACE HEATING <sup>5</sup> (Non-Residential)	NA	0.051	0.047	0.045
RESIDENTIAL SOLAR WATER/SPACE HEATING <sup>6</sup>	\$1,350.00 plus \$0.45/kWH to a maximum of \$3,150.00 <sup>9, 10</sup>	0.051	0.047	0.045
NON-RESIDENTIAL POOL HEATING	NA	0.011	0.010	0.010



# **RECPP – CONFORMING PROJECT INCENTIVE MATRIX**

2012 Program Year

Technology/Application	UP FRONT INCENTIVE <sup>1</sup>	10-Year REC Agreement <sup>2</sup> 10-Year Payment (\$/kWH)	15-Year REC Agreement <sup>2</sup> 15-Year Payment (\$/kWH)	20-Year REC Agreement <sup>2</sup> 20-Year Payment (\$/kWH)
BIOMASS/BIOGAS (Electric)	NA	0.046	0.043	0.041
BIOMASS/BIOGAS – CHP (Electric) <sup>3</sup>	NA	0.027	0.025	0.024
BIOMASS/BIOGAS – CHP (Thermal) <sup>3</sup>		0.014	0.013	0.012
BIOMASS/BIOGAS (thermal)	NA	0.011	0.011	0.010
BIOMASS/BIOGAS (cooling)	NA	0.025	0.023	0.022
DAYLIGHTING (Non-Residential)	\$0.15/kWH <sup>7</sup> See this note for clarification	NA	NA	NA
GEOTHERMAL – (electric)	NA	0.019	0.017	0.017
GEOTHERMAL – (thermal)	0.77/Watt	0.037	0.034	0.033
GEOTHERMAL – (cooling)	NA	0.025	0.023	0.022
SMALL HYDRO	NA	0.046	0.043	0.041
SMALL WIND (grid-tied) <sup>4</sup>	\$1.91/Watt AC	0.111	0.103	0.099
SMALL WIND (off-grid) <sup>4</sup>	\$1.53/Watt AC	0.089	0.082	0.080
SOLAR ELECTRIC:				
RESIDENTIAL (GRID-TIED)	\$3.30/Watt DC <sup>8</sup>	0.154	0.143	0.138
Non-Residential (Grid-Tied) 20 kW or less	\$1.91/Watt DC <sup>8</sup>	0.154	0.143	0.138
NON-RESIDENTIAL (GRID-TIED) More than 20 kW	NA	0.154	0.143	0.138
RESIDENTIAL (OFF-GRID)	\$1.53/Watt DC <sup>8</sup>	NA	NA	NA
NON-RESIDENTIAL (OFF-GRID)	NA	0.093	0.086	0.083
SOLAR SPACE COOLING <sup>5</sup>	NA	0.099	0.092	0.088
SOLAR WATER HEATING/SPACE HEATING <sup>5</sup> (Non-Residential)	NA	0.043	0.040	0.039
RESIDENTIAL SOLAR WATER/SPACE HEATING <sup>6</sup>	\$1,200.00 plus \$0.325/kWH to a maximum of \$2,500.00 <sup>9,10</sup>	0.043	0.040	0.039
NON-RESIDENTIAL POOL HEATING	NA	0.009	0.009	0.008

## **Notes:**

- 1) Residential projects are eligible for an up front incentive (UFI). UFI payments can not exceed 60% of the cost of renewable energy equipment.
- 2) Non-residential under 20 kW is preferably UFI but can be a PBI. Non-residential 20 kW and greater is PBI only. The total of payments under a production based incentive can not exceed 60% of the project costs for any project.
- 3) The CHP incentives may be used in combination for the appropriate components of one system.
- 4) This PBI applies to a maximum system size of 100 kW. Larger wind systems may apply for incentives as NCP.
- 5) The solar space heating and cooling incentives may be used in combination for the appropriate components of one system.
- 6) This category includes both traditional water heating and those systems combined with residential solar water heating used for space heating. Space heating applications require a report detailing energy saving for the complete system.
- 7) Rate applies to measured first five years of energy savings only. Payments are made over a five year period.
- 8) Some installations will require an adjustment of the incentive as detailed in the PV Incentive Adjustment Chart.
- 9) Energy savings rating is based on the SRCC OG-300 published rating or the UNS Electric-RECPP Space Heating Calculator. The customer contribution must be a minimum of 15% of the project cost after accounting for and applying all available Federal and State incentives.
- 10) Rate applies to forecast/measured first year energy savings only.  
NA – Not Available

## ATTACHMENT E

### Solar Space Heating UFI Incentive Calculation Procedure.

In Advance, please perform the Design Review and Utility Bill Review (if Applicable) for numbers to enter in Steps #1, #2 and #5.

Elevation Zone Table:			
Min Elevation	Max Elevation	Heating Season Days	Daily Panel Heat Output
-1000	1000	105	0
1001	3000	140	0
3001	5000	175	0
5001	7000	210	0
7001	9000	245	0
9001	11000	280	0

Collector Thermal Performance Rating		
Data From OG-100 Sheet		
Category:	Delta T	Clear Day
A	-9 Deg. F.	0
B	+9 Deg. F.	0
C	+36 Deg. F.	0
D	+90 Deg. F.	0
E	+144 Deg. F.	0

Enter Solar Panel Make and Model Number Selected for Project:

<b>Step #1:</b>	Enter the result of the Design Review of the Design Annual Building Loss =	<b>0</b>	BTU/Year
<b>Step #2:</b>	Enter the result of the Utility Bill Review of the Actual Annual Building Loss: (If not Electric, Natural Gas or Propane Heat, enter 0) =	<b>0</b>	BTU/Year
<b>Step #3:</b>	Calculate the Lesser of the Result in Step #1 & Step #2 = This is the Annual Building Heat Requirement.	<b>0</b>	BTU/Year
<b>Step #4:</b>	Enter Elevation of the Solar Space Heated Building:	<b>0</b>	Feet AMSL
<b>Step #4 cont:</b>	Number of Heating Days per Heating Season from Elevation Zone Table:	<b>105</b>	Days per Year
<b>Step #4 cont:</b>	Calculate Average Daily Building Heat Requirement =	<b>0</b>	BTU/Day
<b>Step #5:</b>	Enter Passive Heat Storage Specific Heat Capacity from Building Design Review:	<b>0</b>	BTU/Deg. F.
<b>Step #5 cont:</b>	Enter Maximum Daily Room Temperature Variation Allowed by Building Occupants: (Max of 10 Degrees F.)	<b>0</b>	Degrees F.
<b>Step #5 cont:</b>	Calculate Maximum Passive Heat Storage Capacity =	<b>0</b>	BTU
<b>Step #5 cont:</b>	Enter Total Active Heat Storage Heat Capacity from Building Design Review:	<b>0</b>	BTU
<b>Step #5 cont:</b>	Calculate Maximum Total Heat Storage Capacity =	<b>0</b>	BTU
<b>Step #6:</b>	Calculate the Lesser of the Average Daily Building Heat Requirement in Step #4 and the Maximum Total Storage Capacity in Step #5. This is the Maximum Useful Daily Solar Heat Input.	<b>0</b>	BTU/Day
<b>Step #7:</b>	Size the Solar Panels based on a total daily solar heat input no greater than the Maximum Useful Daily Solar Heat Input. Enter the single panel SRCC OG-100 Collector Thermal Performance Rating data in the Table Above.	<b>0</b>	BTU/Day per Panel
<b>Step #7 cont:</b>	Enter the Total number of solar panels to be installed:	<b>0</b>	# of Panels
<b>Step #7 cont:</b>	Calculate the Average Expected Daily Solar Heat Input:	<b>0</b>	BTU/Day
<b>Step #8:</b>	Calculate the Expected Annual Useful Solar KWH Heat Input using the Number of Heating Days times the Average Expected Daily Solar Heat Input / 3415 BTU/KWH:	<b>0</b>	KWH/Year
<b>Step #9:</b>	Enter the UFI per first year KWH UCPP Incentive Rate:	<b>\$0.75</b>	\$/KWH
<b>Step #9 cont:</b>	Calculate the Total Maximum UFI Payment Subject to Possible Limitation by the 50% of Initial Cost Cap & 15% Minimum Customer Contribution:	<b>\$0.00</b>	\$
<b>Step #10:</b>	Enter the Total Solar Space Heating System Initial Cost: This should not include costs for Passive Heat Storage or Building Heating System.	<b>\$0.00</b>	\$
<b>Step #10 cont:</b>	Calculate the Total Expected Federal and Arizona Incentives for this Project:	<b>\$0.00</b>	\$
<b>Step #10 cont:</b>	Calculate the 15% minimum of the Total Solar Space Heating System Initial Cost to be paid by Customer	<b>\$0.00</b>	\$
<b>Step #10 cont:</b>	Calculate the Total Actual UFI Payment:	<b>\$0.00</b>	\$

# Exhibit 2

## Redacted Version

**UNS Electric, Inc.'s  
Renewable Energy Standard & Tariff  
Implementation Plan**

**(Sample Tariff Funding Plan)**

**2008**

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## **ATTACHMENTS**

- Attachment 1** Five-Year Renewable Energy and Capacity Forecast with Cost Estimates
- Attachment 2** Market Cost of Comparable Conventional Generation Conceptual Definition
- Attachment 3** New Mexico Wind Energy Above-MCCCCG Cost Evaluation (REDACTED)
- Attachment 4** Arizona Wind Energy Above-MCCCCG Cost Evaluation (REDACTED)
- Attachment 5** Tucson Area Landfill Gas Energy Above-MCCCCG Cost Evaluation (REDACTED)
- Attachment 6** Tucson Area Solar Energy Above-MCCCCG Cost Evaluation (REDACTED)
- Attachment 7** UNS Electric Environmental Portfolio Standard Programs Report for Year-End 2006
- Attachment 8** UNS Electric UCPP Description
- Attachment 9** UNS Electric REST Line Item Budget

## **I. INTRODUCTION**

UNS Electric, Inc.'s ("UNS Electric" or "Company") Implementation Plan uses the REST Rule Sample Tariff as the limiting funding amount and develops a program around that amount of funding. In effect, the Sample Tariff would reduce the amount of Residential Distributed Renewable Generation to 3.45% instead of 5.00% in 2008 and offers residential photovoltaic ("PV") and solar domestic water heating (SDWH) incentives at levels recommended by the UCPP Working Group. However, this option will not result in UNS Electric being in REST Rule compliance in 2008.

UNS Electric currently estimates that the Sample Tariff approach is estimated to cost \$2.4 million in 2008, \$9.5 million in 2012, with a five-year total of \$29.2 million, but is not likely to provide sufficient funding required to meet the residential distributed-generation portion of the REST requirements. REST funding is intended to cover the cost of utility-scale renewable generation in excess of the market cost of conventional resource alternatives, incentive payments for distributed energy resources, marketing expenses, and program implementation and administration costs. The above-market costs for renewable generation are based upon UNS Electric's current understanding of that market as derived from bids received as a result of an RFP for Renewable energy as well as extensive discussion with renewable energy vendors and installers. The costs for distributed-generation incentives and the program budget are based upon incentives developed as part of the Commission Staff's working group and UNS Electric's best estimations of market uptake for the various technologies available to its customers. Annual increases in the program budget are driven mainly by the annually increasing energy targets.

## **II. PROGRAM BACKGROUND**

### **A. Renewable Energy Requirements**

This Renewable Energy Standard and Tariff Implementation Plan has been created in response to the requirements of Arizona Administrative Code ("A.A.C.") R14-2-1801 through R14-2-1815, formally known as the Renewable Energy Standard and Tariff ("REST") rules. The Plan's main purpose is to present the renewable energy purchase and development plan as UNS Electric's Implementation Plan portfolio and cost recovery mechanisms for the REST. Pursuant to A.A.C. R14-2-1801 et seq., the Company is hereby filing its REST compliance programs. In filings for consideration in the UNS Electric Rate Case, several parties, including the Commission Staff, stated a preference to consider the ultimate cost recovery of such a program through an adjustor mechanism in the context of the greater rate case proceeding. Therefore, consideration is being given regarding the adjustor mechanism in that separate rate case, Docket No. E-04204A-06-0783 (the "UNS Electric Rate Case"), as well as part of this REST program filing. The REST requires that affected utilities satisfy an annual renewable energy requirement by providing a percentage of their retail electric energy sales from renewable resources. The required annual renewable energy percentage for the first year of implementation, 2008, begins at 1.75% and increases to 3.50% in 2012.

Renewable resources under this rule include "renewable generation" projects, which are constructed solely to export their energy production to the utility, and renewable distributed generation ("DG"), which is a renewable resource application acquired, installed, and operated by customers on their premises that is used to displace the customer's energy consumption. As part of the REST, the energy generated or displaced by the DG is applied towards the percentage of the utility's distributed renewable energy requirement. To determine compliance with the REST, the metric used to track energy in kilowatt hours ("kWh") derived from renewable resources is the Renewable Energy Credit ("REC"), with one kWh equaling one REC.

Meeting the REST requirements presents all of the affected Arizona utilities, including UNS Electric, with a number of uncertainties going forward. Given the needs of our neighboring states to meet their renewable energy mandates there could be intense competition for renewable energy sources over the next several years. This competition will add to the other challenges UNS Electric faces in meeting the REST annual energy requirements. These include the timely completion and energy production from contracted renewable energy sources, availability of qualified contractors to install renewable DG facilities, the number of customers who will opt to participate in renewable DG projects, and the further development of technology to make renewable energy sufficiently affordable and reliable to be of primary interest to electric utility customers. Risks also include issues such as: the availability, level and consistency of federal, state and local incentives; the availability of renewable energy projects executed by financially and technically sound developers; the availability of adequate transmission resources to deliver new renewable energy resources to UNS Electric load; the availability of renewable energy projects matching UNS Electric's anticipated cost profiles; the timing of new resource availability; and the ability of DG technologies and technology providers to serve the needs of customers. UNS Electric acknowledged the risks identified above and attempted to account for them in its Implementation Plan. The timely delivery of energy from renewable resources is critical to UNS Electric's compliance with the energy targets; development of these types of projects typically requires between two to five years. Recent experience across the nation indicates renewable generation projects suffer from high levels of project failure, broadly summarized as the inability to meet contract energy delivery dates. These failures and delays can be attributed to a wide range of issues, but are generally attributed to the immature nature of the renewable resource markets. Published experience with renewable energy projects in California suggests that a minimum overall contract failure rate of 20-30% should generally be expected for large solicitations. UNS Electric has attempted to develop an implementation plan that assumes a slightly lower level of project failure rate to that observed in California. As a way to buffer against these risks, UNS Electric's experience with both renewable energy projects and with conventional energy technologies suggests that careful project screening can reduce, but not eliminate, some of the risk associated with project failures. However, as UNS Electric does not currently have a source of sustained funding for above market renewable energy purchases, UNS Electric can not yet enter into a contract for a specific renewable energy source until the REST Implementation Plan and REST Tariff are approved. Consequently, the Implementation Plan is general in nature and not specific with regard to the mix of resources to be used to meet the REST requirements in 2008.

Utilities such as UNS Electric that are affected by the REST rules are required by A.A.C. R14-

2-1813(A) to file an Implementation Plan each year for review and approval by the Arizona Corporation Commission ("Commission"). The Plan must describe the procurement of renewable energy resources for the next five calendar years that will meet the requirements of the REST. This description must identify the considered technologies, the expected schedule for the resource incorporation on a year-by-year basis, and a description of the kilowatts ("kW") capacity and kWh of energy that are expected to be added to the UNS Electric generation portfolio by the incorporation of those renewable energy resources. This is UNS Electric's proposed initial Implementation Plan.

## **B. Development of Renewables in UNS Electric's Service Territory**

### **1. Resource Planning**

UNS Electric has historically recognized that long-term resource planning is an essential element in determining both supply- and demand-side elements of energy production and delivery when making decisions regarding construction of new generation and transmission assets. Beginning in 1994, UNS Electric has studied numerous cost-effective alternative energy sources to meet the growing energy needs of its customers. UNS Electric's long-term resource planning process is an integral part of the renewable energy planning and goal setting process. The forecast of annual kWh of energy and kW of capacity from renewable energy resources by technology to meet the REST goals is listed in Attachment 1.

UNS Electric initially considers self-build renewable energy options in the cost evaluation portion of the planning process, but does not include them as a criterion in determining the need for renewable generation options. Purchased renewable power allows for greater flexibility in use of scarce financial resources in developing renewable generation resources, which are typically priced above the Market Cost of Comparable Conventional Generation ("MCCCG"). Purchase of renewable energy allows UNS Electric to more effectively use its resources in developing renewable energy for its customers through partnering with renewable energy developers. It is thus an essential element in the Company's generation portfolio. However, cost-effective self-build renewable energy options will be pursued as an alternate to purchased renewable energy if necessary. At this time in this Implementation Plan, UNS Electric plans to purchase all of its non-DG renewable energy needed beyond that energy from its existing fleet of wind and solar generation systems and a landfill gas-to-energy facility. UNS Electric may, as a last resort if purchased renewable energy supplies are insufficient to meet REST requirements, purchase Renewable Energy Credits from its bank created during the EPS program to meet REST requirements.

UNS Electric uses an Independent Monitor to review the request-for-proposals ("RFP") evaluation criteria and process to ensure a fair and equitable RFP evaluation is performed in comparing bids against each other as well as against the MCCCG.

### **2. Market Cost of Comparable Conventional Generation**

MCCCG, as used in the evaluation of renewable energy bids and as used in the context of determining the above-MCCCG costs of purchased renewable energy for recovery in the REST

Adjustor Mechanism calculation, is determined from market costs based on bids received from our pending purchases of conventional energy sources RFP process and/or the cost of UNS Electric's generation depending on the type of purchased renewable generation resource (firm, non-firm, dispatchable, etc.) and the market conditions at the time of the renewable purchase.

This above-MCCCG portion of purchased renewable energy resources is recovered under the REST Tariff Surcharge as determined in the REST Adjustor Mechanism calculation, whereas the portion of the cost of the renewable energy purchased that is at or below the MCCCG is recovered in the base generation rates. It is therefore important for the proper allocation of generation costs that the MCCCG of the purchased renewable generation be known with precision.

An MCCCG conceptual definition and matrix document, attached as Attachment 2, was developed to determine the applicable market conditions and the type of the purchased renewable generation resource for which the MCCCG is to be evaluated. The matrix is based on the renewable energy technology type employed and the market conditions, along with dispatch conditions at the time of the production of the renewable energy under evaluation. The MCCCG calculation will be dependent on the hour of the day, the season of the year and the month. The MCCCG will be evaluated for true up as part of the REST Adjustor Mechanism Tariff Surcharge calculation at the end of each year by running UNS Electric's PROMOD model software against the purchased renewable generation costs. As discussed above, the cost of the purchased renewable generation above the MCCCG costs will be included in the REST Tariff Surcharge as determined in the REST Adjustor Mechanism calculation.

UNS Electric undertook a study that applied the matrix to the 2006 actual generation market conditions and proposed generation profiles of wind generation and round-the-clock generation bids received in 2007 to determine the MCCCG of the renewable energy options. The evaluation resulted in MCCCG values for each of UNS Electric's meter billing periods. These hourly MCCCG values were then applied against the hourly generation profiles for the three lowest cost-option renewable generation proposals offered in response to UNS Electric's 2007 RFP for renewable generation. For wind power produced in New Mexico, the above-MCCCG cost was \$ [REDACTED] per MWh, for wind power produced in Arizona, the above MCCCG cost was \$ [REDACTED] per MWh, for an Arizona landfill gas location the MCCCG was \$ [REDACTED] per MWh and for solar power produced in Tucson it was \$ [REDACTED] per MWh. See Attachments 3, 4, 5 and 6, respectively, but these attachments are not provided with the redacted version of this Implementation Plan.<sup>1</sup>

### **3. Transmission**

All of the wind renewable energy resources evaluated for MCCCG are located at least 150 miles from Mohave or Santa Cruz Counties. Thus, transmission on existing or new lines will be

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<sup>1</sup> The UNS Electric REST Implementation Plan contains confidential information. Accordingly, the Company is filing a redacted public version of the UNS Electric REST Implementation Plan. A non-redacted version of the UNS Electric REST Implementation Plan is being provided to Commission Staff and other parties to this proceeding upon execution of a confidentiality agreement.

required to bring the energy from these resources to the customer loads in those locations. Nevertheless, UNS Electric believes the REST goals for 2008 through 2010 are not of large enough magnitude to require additional transmission to support purchased renewable power delivery to UNS Electric planned under the Implementation Plan. However, it is very likely that the resources needed to meet the 2011 and future REST goals of UNS Electric will require additional transmission between the windy areas of Arizona north of the Mogollon Rim and the UNS Electric population centers. It is important that the transmission planning process include the needs for moving renewable energy from the resource sites to the population centers. It is also important that the Commission determine an appropriate transmission expense recovery method in advance of the need to build these transmission lines to ensure investor confidence in financial support of the transmission line construction. It is not yet clear if additional transmission will be required or, if it is required, what would be appropriate venue in which to recover the expenses of such transmission. In some cases, as discussed below, strategically located energy storage could mitigate the need for additional transmission. Consequently, we do not propose any expense recovery mechanism for transmission in support of renewable energy resources at this time, but reserve the right to propose such recovery in future years.

As UNS Electric transitions to a low-carbon, sustainable generation portfolio with energy storage over the next 100 years while supporting continued customer growth and the transition of transportation technologies from a base of fossil fuels to electric energy based sources, there may be an increased need for additional transmission capacity from the more remote areas of Arizona, where wind generation and central solar generation is most cost effective, to the population centers. However, effective use of optimally located energy storage in combination with the location of central solar generation at the sites of existing power plants and customer sited renewable generation could reduce the need for additional transmission. Further study and evaluation is needed in this area. For this reason, UNS Electric does not recommend any specific additional transmission needs at this time.

#### **4. Renewable Generation Integration Management**

There are costs associated with the integration and load-balancing of intermittent renewable resources such as solar or wind. The current lowest-cost renewable energy resource available to UNS Electric is wind generation. Many studies have been published of the costs of integrating wind generation into a utility generation portfolio, most recently by Idaho Power in citing a cost of over \$10 per MWh for integration using hydrogeneration resources for balancing. Studies performed by Tucson Electric Power ("TEP"), which have been recognized by a recent \$100,000 grant award from the Department of Energy to develop evaluation methods for determining the capacity value of solar generation to utilities, indicate that solar generation without some integrated energy storage – both central plant and distributed – has a much greater time-variant percentage fluctuation in output than does wind generation over the same time frame. Preliminary studies by TEP and Carnegie Mellon University indicate geographic diversity is not as effective in reducing the high level of variation in the output of solar generation as it is for the output of wind generation. While the cost study for integration of solar energy into a utility generation portfolio is not yet complete, UNS Electric does not expect that the cost of managing the integration of both time variant renewable generation sources, solar and wind, will be more than an insignificant factor until the year 2011, based on the lower initial REST annual energy

percentages in the early program years. UNS Electric will use the data taken in the years prior to 2011 to evaluate the cost impact of integrating wind and solar generation with its existing fueled generation portfolio. After 2011, UNS Electric expects to include a factor for recovery of integration costs in its REST Tariff through the REST Adjustor Mechanism, and thus requests approval of that factor, not the amount of the charge, at this time.

## **5. Distributed Generation**

The REST requires that affected utilities satisfy a percentage of their annual renewable energy requirement through the addition of distributed energy resources. The required DG percentage for the current implementation period begins at 10% of the 1.75% total requirement in 2008, and increases to 30% of the 3.5% total requirement in 2012. That percentage remains at 30% of the total renewable energy requirement through 2025.

Considerable public discussion has surrounded the DG targets described in the REST. This discussion has centered on questions related to the magnitude of customer interest in DG, the effect of introducing many new distributed technologies, the ability of the technology suppliers and installers to meet the potential customer demand, long term reliability of these technologies and, ultimately, the total cost of incentives required to drive the required customer participation to meet REST compliance. The extent of customer participation is the primary driver of DG results and it is simply unknown and unknowable at this time. UNS Electric's three years of experience with its SunShare Incentive Program demonstrated that changes in public policy affecting the program (i.e., state and federal tax incentive increases) and changes in program incentives can have dramatic impacts on customer participation, in some cases beyond those anticipated and positive results can be location specific. There is virtually no way to accurately predict whether the amount of incentives being offered will motivate customers in all parts of the service territory to participate at the necessary rate for full REST compliance. This is particularly germane, because even with availability of significant incentives, customers must still provide significant personal funding in order to have DG systems installed on their homes or businesses. Today, the typical residential distributed photovoltaic system costs about \$21,000 to install, attracts about \$10,000 in government and utility incentives, and requires a customer investment of about \$11,000.

UNS Electric recognizes that DG is an important component of the renewable energy goals of the REST, and, as part of the Implementation Plan, UNS Electric proposes a funding level believed necessary for compliance. UNS Electric recognizes that uncertainty exists with respect to the proposed incentive levels and the total number of RECs that they will generate; however, in order to comply with the DG targets, UNS Electric believes this funding level is necessary if consumer demand for DG is adequate to meet the REST DG annual energy requirements. The assumptions used to build the DG program budget are based on incentives developed as part of Commission Staff's UCPP working group, market insights from those same meetings, and UNS Electric's experience with its SunShare Program modeled with customer payback term scenarios and current federal and state incentives. If the DG program assumptions prove to be correct, the first year cost for the DG component of the Implementation Plan is estimated to be approximately \$3.9 million. This amount escalates to approximately \$9.1 million in 2012. UNS Electric expects in this Implementation Plan to purchase all REST DG credits through its SunShare program offerings as described in the UCPP program below.

UNS Electric believes that customer-sited renewable DG systems are part of the long-term goal of a sustainable, Arizona self-sufficient energy supply for our customers. Thus, a Uniform Credit Purchase Program ("UCPP") is proposed to be offered for our customers who install and operate renewable DG systems.

UNS Electric has also implemented a true net-metering program, approved by the Commission in 2004; instituted a solar energy system rebate program, SunShare, approved by the Commission in August 2004; and has established a simple one-page, one-step residential solar or wind interconnection application process. While development of distributed renewable generation will reduce UNS Electric's need to produce electric energy from fossil fuels to meet its customer's energy needs, central or distributed solar and wind generation have demonstrated over three years of UNS Electric renewable energy production and SunShare experience that they are not able alone to meet the firm capacity or voltage control requirements essential in providing safe, reliable electricity service to all of our customers. Historic data indicates there is nearly zero firm capacity benefit from the installation by Mohave County- or Santa Cruz County-based customers of distributed solar and wind generation systems to UNS Electric at the time of annual peak loads due to typical monsoon conditions that drive the peak loads, yet generally cover the sky with clouds as the loads peak.

There are both additional benefit factors as well as additional cost factors to UNS Electric from customers installing and operating renewable DG systems at their homes or businesses. Distributed Generation can provide benefits to both the customers owning the DG as well as to the utility in whose distribution system the DG has been installed. There are also costs from the installation of DG to both the owner of the DG and the utility. If the DG output is not time-variant the benefits are demonstrably higher and the costs lower to both the DG owner and the utility. However, if the output is time variant or is a function of weather patterns which can affect peak utility system demand, such as monsoon cycles, the benefit of the DG for firm capacity support is significantly reduced. Other benefits include: (1) reduced line losses, (2) increased life for current induced heating devices like transformers, (3) reduced water consumption at generating plants, (4) reduced emissions from conventional generating plants, and (5) reduced impact from the recovery and transportation processes used to provide fossil fuels for conventional generating plants.

Costs of DG to the owner include the cost of any required fuel, operation and maintenance costs ("O&M"), initial installation costs and ownership costs including financing, taxes and insurance associated with ownership of a generation system. There are also costs to the utility from, among others: (1) the increased need for rapid response automatic voltage control and load management devices in the distribution systems, (2) increased hardware to provide proper protection to distribution circuits with high percentages of DG installed, (3) additional repair time after a storm to clear DG sources prior to start of work, (4) increased outage recovery time from uncontrollable (to the utility) DG resources that start generating automatically in an unpredictable manner, and (5) lost revenue from the reduced sales of electricity with consumption only based rate structures. The quantification of these benefits and costs is very much utility-specific and of fairly low magnitude at the low levels of DG penetration expected in 2008 through 2010. While accurate, valid data is also difficult to obtain at low levels of DG



penetration, over time as DG installations increase the data quality and quantity will improve and benefits and costs of renewable DG will be accurately quantified.

Net-metering programs provide an added benefit to the DG owner by providing a credit at the retail rate for generation output produced in excess of use over a given time period. For time variant non-dispatchable DG systems like solar or wind, this can be a large benefit as DG output cannot be easily scheduled by the owner to match demand. Utilities can positively impact a decision to install DG by offering net-metering programs for time variant DG systems and by eliminating or reducing the cost of the interconnection to the utility grid. Utilities can also positively support installation of DG by eliminating or reducing backup capacity and energy fees, charged to a DG customer when the DG system is not operational for planned or unplanned reasons. Utilities positively support renewable DG systems, such as solar generation, through providing rebate programs to reduce the initial cost of a DG system or through providing production based REC purchase programs to provide an ongoing revenue stream for the owner to offset O&M and ownership costs.

Utilities receive a benefit from DG systems primarily from dependable reductions in peak annual demand from the generation output of DG systems during high load-demand hours. Firm, guaranteed reductions in peak demand allow utilities to reduce requirements for building generation, transmission and distribution capacity. However, if the DG generation is not firm and guaranteed to a very high degree of confidence over many annual load cycles, the utility cannot reduce its planned capacity requirements from customer installation of DG. Utilities will benefit from fuel use reductions and reductions in distribution losses through DG installation, effectively the variable portion of energy production expenses. There can also be a benefit to utilities from an increase in operational life for various distribution components, such as transformers and underground cables whose life is reduced by operation at elevated temperatures, created in part by high electrical loads. However, this benefit is also heavily dependent upon the ability of the DG to provide firm, highly reliable output during the highest load demand hours of the year. Thus, to a utility, the benefit of DG is a very large function of the capacity credit assigned a generator based on its proven ability to provide electrical generation output during the peak load demand hours of the year for that utility.

The costs of renewable DG to a utility include the direct cost of any rebates or production payments made for renewable generation, as well as internal and external labor or consultant costs of reviewing interconnection plans and providing interconnection devices to DG installers. However, in many cases, the largest cost to a utility from installation of DG systems is lost revenues from energy-only based utility rates, as a DG system reduces the energy consumption of the owner. The DG owner still must have a distribution drop to their premises, the distribution, transmission and generation capacity must still be available to support demand, the meter must still be read and bills prepared, remittances processed and administration of the utility provided.

A time-variant DG system does reduce utility annual fuel use and line losses in the distribution system. However, since the energy-based utility rate DG owner uses less energy per billing cycle, that owner will be providing reduced amounts of revenue to the utility to compensate for those services which the utility is obligated to continue providing and the DG owner requires for

continuity of service. This can be addressed through partial requirements tariffs, backup service charges, an increase in the monthly fixed service charge and other rate mechanisms designed to provide a decoupling of the fixed cost of providing electrical service from energy production based related charges. Decoupling of rates from consumption can reduce this negative impact and more closely align the financial interests of customers and utilities for support of self-generation. UNS Electric requests approval of a REST Performance Incentive to provide some timely recovery of this lost revenue as a component of the REST Tariff Surcharge as determined in the REST Adjustor Mechanism calculation. A per kWh tariff equal to the average per kWh of the fixed monthly charges, applied to the DG output could also be used to compensate utilities for the loss of fixed charge revenue from DG customers with self-generation installations, but is not being requested by UNS Electric at this time. This Performance Incentive program is addressed in the REST Application.

Time-variant DG output would appear to a utility control system as variable negative load. If the amount of DG output variance exceeded the amount of load variation normally experienced by the utility, it could result in the need for additional high ramp rate peaking generation or storage capacity, beyond what would be required without the time variant DG installations. The cost of installation and operation of natural gas fired high ramp rate capability firming generation, or electrical energy storage is an additional cost to a utility for support of time variant DG sources in its service territory. The installation of rapid change, time-variant DG, coupled with the current inability of solar generation systems to provide reactive power, may also adversely impact the ability of existing utility voltage control devices, primarily slow response capacitor banks, to adjust reactive power flows to support local distribution system voltage in a sustainable, reliable manner during cloud passing events. Additional grid regulation support requirements, such as low voltage ride-through, droop support and frequency stability regulation are not currently provided by grid-connected solar generation systems and will consequently need to be provided in greater quantities by utilities in the future, with the associated cost of installation, maintenance and operation of these control devices.

Due to the relatively small amount of renewable DG installed in any North American utility service territory, there is not sufficient verified cost data to accurately and unambiguously determine the cost or benefits of renewable DG to UNS Electric. Therefore, UNS Electric does not propose an allowance for indirect costs or benefits of renewable DG be applied to increase or decrease the expenses UNS Electric will incur in offering a renewable DG incentive program at this time. The REST Adjustor Mechanism will reflect recovery of all actual direct expenses of the renewable DG program. In the future, as verifiable cost and benefit data is available from renewable DG programs with significant participation in the UNS Electric service territory, the Company will apply those indirect factors to the REST Adjustor Mechanism value calculation.

### **C. Pricing Assumptions**

Several of the attachments contained in this Plan include pricing estimates that have been made by UNS Electric in development of the program costs. Some of the pricing included in this Plan is pricing from existing confidential proposals. The price estimates are necessary to allow UNS Electric to provide the information sought by the Commission as part of the background and support for the Implementation Plan. In addition, summary expenditures and energy requirements for generation provided on a year by year basis could be used to infer much of the

confidential pricing information. UNS Electric believes it is in the best interest of the Company and our customers to ensure that future suppliers of renewable resources compete for the right to supply renewable energy without a pre-conceived notion of the pricing assumptions or confidential pricing in this Plan. Therefore, UNS Electric has submitted a redacted version of that confidential information and will provide Staff the competitively confidential information pursuant to an executed Confidentiality Agreement.

This Plan makes reasonable assumptions concerning renewable energy resources, and as UNS Electric gains more experience with renewable resources, future plans will account for the realities UNS Electric encounters in the actual implementation of the REST.

### **III. UNS ELECTRIC'S REST IMPLEMENTATION PLAN**

#### **A. Energy**

The minimum annual percentage of a utility's retail sales that must be obtained from renewable resources is identified in the REST; the Plan's first-year target for 2008 is 1.75%. The renewable resource targets required to meet UNS Electric's targets for each year are detailed in Attachment 1. The REST targets are described in two categories, renewable generation and distributed generation resources.

Renewable generation consists of projects that export their energy production to the utility. These projects are typically large-scale facilities that use renewable resources such as wind, solar, geothermal, biomass, and biogas to generate electricity. Energy produced from those resources is delivered through transmission and distribution systems and, ultimately, to the utility's customers.

Distributed generation resources represent technology applications that are physically installed on the customer's property. These applications are usually designed specifically for the distributed setting. Distributed applications under the REST would include a wide range of technologies; these technologies are currently most frequently represented by photovoltaic and solar water heating systems. The DG displaces some of the customer's energy needs, and can be tied to the existing UNS Electric distribution system or installed as a remote application independent of the UNS Electric distribution system. UNS Electric does not plan to install DG at customers' properties other than through our GreenWatts funded community leadership sited projects; rather, the installation of DG is facilitated by providing customers with financial incentives for the installation of such resources by licensed contractors.

#### **B. Capacity**

There are no capacity (in kW) requirements in the REST targets, but rather requirements are energy-based (kWh) only. However, this Plan utilizes historic generation capacity assumptions to forecast compliance with the energy targets. When one is equating energy targets to planned capacity levels, it is important to recognize that the capacity factors for various renewable generation technologies vary significantly. Some technologies, such as biomass and

geothermal, are predictable and can produce energy at capacity factors of approximately 80-90%, similar to conventional-base load generation. Other renewable generation technologies, such as solar, are less predictable and have inherently low capacity factors of 15-30%, which are driven by daily fluctuations such as the availability of solar radiation and are influenced by location. There are other renewable generation technologies, such as wind, which are less predictable on a real-time basis. On an annual basis, however, wind will generally produce capacity factors in the range of 25-35%, depending upon the characteristics of the wind resource in a specific location.

A key factor in reaching a target, therefore, is the combination of technologies utilized, and the ultimate mixture will dictate the additional capacity required to achieve the energy targets. Attachment 1 provides the level of capacity for the specific mixture of technologies assumed in the Plan for the coming five years. This material is not intended to be an exact representation of the resources UNS Electric intends to acquire, but rather is offered as an example of a potential resource mix, based upon UNS Electric's current understanding of the marketplace. The economics of a particular technology or resource will ultimately determine the extent to which any one technology is employed as part of the overall portfolio's content.

### **C. Renewable Generation**

This Implementation Plan has been designed for sufficient flexibility in order to provide the maximum opportunities to meet or exceed the REST target at a reasonable cost. The following sets forth descriptions of the expected resource additions over the next five years.

#### **1. Existing Renewable Generation**

UNS Electric presently has no power purchase agreements ("PPA") for renewable generation resources. However, UNS Electric owns and operates approximately 0.008 MW of solar capacity. The composition of the existing portfolio is detailed in Attachment 7.

#### **2. Renewable Generation Procurement Plan and Process**

Energy required to meet the UNS Electric targets and the anticipated demand for renewable rates in each of the next five years is outlined in Attachment 1. Generally speaking, two to five years is required from the initiation of a project via a Request for Proposal ("RFP") to the point at which energy can flow into the UNS Electric system from a completed renewable generation project. The development and construction of the project itself accounts for the majority of that time period; therefore, an RFP process started in 2007 may realistically be expected to result in producing renewable energy applicable to the renewable resource target in 2009 at the earliest.

UNS Electric estimates that it will need additional amounts of renewable energy commencing in 2008, in addition to that which has already been built. As a result, UNS Electric implemented a competitive procurement process in 2005, 2006 and most recently in 2007. The competitive procurement process consists of, but is not limited to, the issuance of RFPs, negotiated bilateral supply contracts, and other competitive solicitations seeking long-term renewable resources. Implementing an effective competitive procurement process will ensure a

fair and unbiased procedure that will efficiently incorporate a full range of renewable resource alternatives from the marketplace. However, until a long-term funding source is available through Commission approval of the Implementation Plan and its associated REST Tariff, UNS Electric is not able to consummate a renewable energy PPA at above-market prices.

During the evaluation of submitted bids during the competitive procurement process, UNS Electric's review of proposals will include analysis of: energy production; capacity value; deliverability; technical characteristics; operational performance; reliability; efficiency; credit worthiness; grid impact mitigation; and respondent experience. The procurement and project selection procedure employed by UNS Electric has been documented and certified to be fair and appropriate by an independent auditor as required by the REST.

UNS Electric's Implementation Plan attempts to fully acknowledge the reality that PPAs and project development methods will not necessarily conform to required delivery schedules and planned quantities. Renewable generation projects, like other generation projects, may fail to achieve scheduled commercial operation. A recent review of renewable projects in California stated that utilities should expect that 20-30% of renewable contracts would experience termination or major delays. Delays or failures of that magnitude could cause UNS Electric to fall short of its renewable energy targets. Thus, such risks require UNS Electric to design and employ contingency measures. In order to prevent energy shortfalls resulting from these risks, a procurement goal of 120% of the target energy for three to five years into the future will be employed.

### **3. Identifying Renewable Generation Requirements**

The renewable resource targets increase from 1.75% in 2008 to 3.50% in 2012 during the five-year period of this Plan. The Plan focuses on existing and planned renewable resource projects to meet those targets. It is also contemplated that new renewable generation will be contracted for and developed during that five-year period. It should be noted that UNS Electric has based its program's budget and energy procurement on several assumptions that are mentioned in the discussion that follows. Some details are competitively confidential; that information has been redacted but will be provided to Staff pursuant to an executed Confidentiality Agreement.

#### **a. Costs of Renewable Generation**

The costs of renewable generation are based for the purposes of resource and budget planning upon the portion of the renewable energy cost that is above the Market Cost of Comparable Conventional Generation (MCCCG). The value amount above UNS Electric's cost for comparable generation was established at the time the bids of proposed contracts were evaluated, and that value is applied to the total proposed purchased power cost for the planning year. For future contracts, the price is estimated based upon existing renewable generation contracts, recent market experience, and general trends observed in renewable generation project development. Subsequently, these numbers will be re-evaluated during subsequent five-year planning periods. All renewable resource costs are described in terms of dollars per megawatt hour ("MWh") above UNS Electric's comparable conventional generation values. The detailed cost assumptions used to develop the budget for procurement of these resources

are included in Attachments 3, 4, 5, and 6. Again, this information is competitively confidential and will be provided to Staff pursuant to an executed Confidentiality Agreement.

#### **b. Planned Resource Additions**

The REST renewable targets' annual increases suggest that renewable generation resources can be developed and procured in increments sized to match annual increases. However, a utility's ability to add renewable resources in amounts that specifically match the requirement is unlikely. Therefore, in some years the renewable generation procured will exceed that specifically targeted; these excess additions are sometimes referred to as "non-linear additions." The schedule of resource additions provided in Attachment 1 identifies specific targeted additions of renewable resources. The planning model incorporates an assumed-capacity factor for each renewable technology. The modeled capacity factors are based on UNS Electric's review of technical performance data for each technology, discussions with project developers, and a review of published information related to currently operating commercial renewable resources.

#### **D. Distributed Generation**

UNS Electric has identified DG as an important component of the renewable energy goals of the REST, and, as part of this Plan, UNS Electric proposes a funding level it believes necessary for compliance each year to support the distributed generation program. UNS Electric recognizes that uncertainty exists with respect to the proposed incentive levels and the total number of generated Renewable Energy Credits; however, in order to comply with the DG targets, UNS Electric believes that the proposed funding level is necessary to accommodate required consumer demand for DG.

As a result, UNS Electric has requested a level of funding for its first REST Tariff Adjustor Mechanism necessary to recover only the 2008 estimated expenses for the DG program. Increases in the adjustor will be required in future years for UNS Electric to meet the DG requirements in the REST. UNS Electric believes that adjusting the funding annually allows UNS Electric, working with the Commission, to implement a flexible program with a clear understanding of program performance and costs without over-collecting funds from customers in the near-term or compromising the overall resource goals of this Plan and the REST.

The Commission's Staff initiated the Uniform Credit Purchase Program ("UCPP") working group described in A.A.C. R14-2-1810 in June 2006, and UNS Electric participated in all of the working group's efforts. UNS Electric has generally used the approach developed by the UCPP working group for the Company's proposed DG incentive program. The working group has made significant progress towards identifying program workflows, technology-sensitive incentive structures and levels, and technology-specific requirements and limitations. The efforts of the working group also provided UNS Electric with insight into the anticipated potential contributions from technologies not previously included in UNS Electric's SunShare programs. Planning models, implementation strategies, and budgeting for the DG program were all designed with specific consideration for the UCPP working group's recommendations. In addition, UNS Electric relied on over three years' experience with its SunShare Program, as

well as on continuing dialogue with many industry and consumer stakeholders.

## **1. Anticipated DG Program Outcomes**

UNS Electric has developed a set of planning tools to help anticipate DG program outcomes, both from energy and budgetary perspectives. In developing the anticipated program outcomes for this Plan, a number of assumptions about technologies and customer preferences were first necessitated. The assumptions included the anticipated number of categorical projects requesting incentives and the anticipated energy contribution from each DG project. Anticipated energy contribution is calculated by utilizing assumptions on average project size and average project production. The detailed assumptions were required for purposes of budget and planning, but are not intended to reflect allocations, funding caps, or preference for any one technology. These energy-production assumptions are set forth in Attachment 1.

Included in the UNS Electric UCPP are incentives drawn from the draft UCPP working group efforts. The UCPP, as generally described herein and as shown in Attachment 8, details different incentive types for use in the DG program. For planning purposes, assumptions about customer preference for the variety of incentive alternatives were utilized.

The UNS Electric-proposed DG budget, combined with these planning assumptions, results in specific outcomes as noted in Attachment 1. The actual results of program implementation may well be different from those anticipated by UNS Electric's planning efforts, as customers learn more about the variety of technologies and applications available as a result of UNS Electric's program marketing, advertising, and partnership-development efforts.

## **2. Key Components of the Proposed DG Administration Plan**

UNS Electric's distributed generation program is detailed in Attachment 8. The following describes several key common components of UNS Electric's program as set forth in the proposed UCPP.

### **a. Administration**

Project funding is not guaranteed until a reservation confirmation is provided by UNS Electric for each project. To receive a reservation and an incentive, applicants must follow the established reservation, installation, and inspection procedures.

### **b. Equipment and Installation Requirements**

The installed DG systems will be required to adhere to generally accepted industry standards, federal, state and local codes, all applicable regulatory requirements, and manufacturer recommendations for installation and operation. Systems must be installed and warranted by an Arizona licensed contractor holding an active certification for the technology being installed, or in some cases by a residential homeowner if willing to accept a lower level of incentive.

### **c. Incentives**

Incentives are designed to defray some of the costs of a system designed to offset a typical load of a customer. Systems qualifying for DG incentives cannot qualify for other utility incentives.

Residential: Customers applying for residential incentives may apply for a one-time payment based upon the DG system's capacity, or based upon the estimated first-year savings provided by the DG system, dependant upon the technology used. This type of incentive is referred to as an Up-Front Incentive ("UFI"). Residential customers can also apply for a production-based incentive ("PBI") as an option or if their warranty conditions are not sufficient to meet the UFI qualifications.

Non-Residential: Non-residential customers will either receive a UFI or a PBI, which is paid out over time. Projects receiving PBI payments are paid based on system energy output rather than on system capacity. Projects with a capacity less than or equal to 20 kW can elect to receive a one-time capacity based UFI; all others will receive incentives based upon production, a PBI.

### **d. Non-Conforming Projects**

Those DG projects that fall outside of the standard administrative, equipment, or incentive requirements for UCPP projects or projects that are solicited by UNS Electric to achieve specific program goals may be eligible for incentives as non-conforming projects. These projects must be comparable to conforming projects in financial efficiency in order to be considered eligible for incentives.

### **e. Customer Self-Directed Option**

Per the REST Rule, certain interested eligible customers are required to apply and declare the amount of the self-directed funding requested before May 1<sup>st</sup> of the year prior to the request for funding payment, effectively at least 60 days before the Implementation Plan is filed for the upcoming year. These projects must be comparable to conforming projects in financial efficiency to be considered for incentives. The amount of funds allocated to customer self-directed projects will be disclosed in the Plan for the next program year. For 2008, there will be no funds available for self-directed projects as no funds for such programs are expected to be collected under the REST Tariff in 2007. For details of the proposed Self-Directed Tariff, see the REST Application.

## **3. Distributed Generation Incentive Budgets**

UNS Electric's proposed DG incentive budget for the five-year planning window is described in Attachment 9. The incentive budget is designed to result in 34.5% of the distributed energy to be from residential installations and 65.5% from non-residential. Annual increases in program budget



are designed to accommodate both an increase in the DG energy target and to account for the increasing levels of commitment to PBIs, which are used primarily for non-residential DG resources. The incentive matrices incorporated as part of the UCPP describe incentive reductions every two years of the program. Those planned reductions were designed by the UCPP working group to reflect the anticipation that DG technologies will decline in cost as market penetration and product availability increases. Three specific allocations are described in Attachment 9. They include: non-residential UFI; non-residential PBIs; and residential UFIs.

The UCPP describes potential funding for customer self-directed projects. As part of the UCPP, a budgetary earmark is required in order to fund projects meeting the criteria of customer self-directed projects. No funds have presently been paid to UNS Electric as part of the REST, and therefore no projects currently qualify for customer self-directed funds or would in 2008. Consequently, no allocation for self-directed or non-conforming projects has been established in this inaugural Plan.

The annual funding level for DG incentives was established based upon the estimates of the renewable energy needed for compliance, anticipated consumer demand, projected sales and development time frames, variations in the levels of technology maturity, and availability of equipment for installation. Should it happen that funds collected for use in the DG incentive program are not fully subscribed within a program year, those funds will be applied to the next program year and allocated to achieve the required energy outcome between residential and non-residential projects. Those overcollected funds would reduce the amount of the REST Tariff Adjustor Mechanism Tariff Surcharge in the subsequent year.

#### **4. Marketing, Advertising and Partnership Development**

UNS Electric is committed to conducting an action-oriented marketing campaign that will not only inform and educate consumers about the importance of renewable distributed generation and its potential benefits to customers and the community at large, but also spur them into investing in renewable energy.

Education and community awareness are the catalysts for the shift in public attitude required to jump-start the robust solar energy market envisioned by political leaders and DG advocates. Information is the prerequisite in achieving real movement toward alternative energy solutions. But fostering enhanced knowledge on the subject is not enough; ultimately, the goal is to proliferate solar and renewable energy DG in the Mohave or Santa Cruz County areas.

The marketing campaign will take a three-pronged strategic approach: 1) identify key stakeholders and analyze their specific interests; 2) educate those stakeholders (such as residential customers, business owners, students and opinion leaders) about the nature and benefits of DG; and 3) create marketing messages that encourage customers to take action, while promoting incentives designed to make DG an attractive choice for customers to reduce their carbon footprint.

The following key marketing components are designed to bring DG into the mainstream:

- Create an actionable campaign that focuses on the benefits, improved reliability and environmental impact of DG, with the intent that consumers will see DG in a whole new light.
- Utilize media that will best reach our various stakeholders through both paid and public service messages, as well as earned media.
- Develop collateral pieces for both residential and non-residential customer acquisition.
- Heavily promote the DG program on [uesaz.com](http://uesaz.com) and through customer communication vehicles such as bill inserts, e-newsletters and bill messaging.
- Maximize participation in green expos and other targeted community-wide events.
- Create and promote solar-based educational programs for the schools.
- Identify and solicit the support of "change agents" in the community who can effectively influence key stakeholder groups.
- Partner with various media outlets and vendors to develop co-promotions based around distributed generation; provide supporting collateral such as site signage and counter displays for added promotional support.
- Expand partnerships with area solar installers by continuing to provide technical expertise and collateral materials as well as sharing industry news and product updates.
- Escalate UNS Electric's involvement in the community dialogue about energy sustainability, lending expertise and experience through existing networks, ranging from classroom presentations and demonstration projects to interaction with environmental organizations and homeowner associations.

UNS Electric and its affiliate TEP have been widely recognized for many years as a leader in the development and installation of solar energy systems. As a byproduct of that leadership, UNS Electric has cultivated relationships, and acquired industry intelligence, that can now be applied to the propagation of DG in the Mohave and Santa Cruz County areas.

The previously described marketing components are based on currently available data. As the campaign proceeds, UNS Electric staff will monitor and analyze results, and will consider modifications to the campaign that mitigate deficiencies or capitalize on successes.

#### **E. Implementation and Administration**

As part of the development of a strategy and budget for REST implementation, a logical separation was created between 1) those elements required to support the renewable

generation portion of the program and 2) the DG portion of the program. Renewable generation involves expertise in utility-scale technologies, competitive procurement and evaluation processes, project siting, utility integration, transmission- and distribution-related issues, complex contract negotiations, and contract management. The DG program will be a mass-market program involving thousands of individual interactions requiring customer communication, interconnections, inspections, customer billing, and a sophisticated system to monitor REC production. Certain UNS Electric resources will be used to support both portions of the REST, and these are discussed below.

### **1. Resources Required for the Renewable Generation Program**

A renewable generation program requires knowledge-area experts to identify those aspects of renewable generation procurement, engineering, and market analysis that are unique from those same areas in conventional energy operation, and to coordinate with the impacted operational areas of UNS Electric in order to seamlessly integrate renewable resource management into UNS Electric's standard utility business practices. These experts comprising the renewable generation administrative team include the personnel necessary to manage the program, which incorporates establishing policies and procedures, procuring renewable generation, handling contract administration and construction management, managing benchmarking and resource integration studies, and performing program monitoring and compliance reporting.

There are also UNS Electric employees supporting the program that are neither part of the administrative nor the implementation teams. These personnel are considered "non-incremental" and are required to support the general operations of the utility and have responsibilities that are not directly related to the distributed-generation program. These would include, but would not be limited to, employees within UNS Electric's regulatory, pricing, accounting, legal, contract administration, and meter reading areas.

### **2. Resources Required for the Distributed Generation Program**

The implementation strategy for the DG program was developed with the following goals:

- Developing an accurate, efficient and customer-friendly process.
- Integrating the program's processes into the general business operations.
- Creating a measurable process that responds to adjustments in the volume of program participation.
- Supporting the strategic marketing efforts of the program.

In order to accomplish these goals, a significant investment in program implementation and management is needed. The DG program represents a significant number of individual transactions, and each transaction impacts numerous parts of UNS Electric's business infrastructure. Thus, implementation costs for the DG program are significant.

#### **a. Program Resources**

The program's personnel team is comprised of the human resources necessary to execute the DG incentive program. This includes the fixed-payroll personnel required to administer the reservation and interconnection applications and agreements, review system design for conformance with UCPP and interconnection requirements, process incentive payments, answer customer and installer questions about the program, and perform field inspections. It also includes the variable-payroll personnel required to program and install net or performance meters, label utility equipment to identify potential backfeed sources, and provide billing support to net-metering customers. Further needed are the employees required to manage the execution of the program, develop and execute the marketing and advertising programs, and provide ongoing program monitoring and compliance reporting. The number of implementation team members required is proportional to both the number of applicants at any one time and the number of program participants. Additionally, just as in the case of renewable generation resources discussed above, many non-incremental employees will also be needed to support the DG program.

#### **b. Material Costs**

In order to measure the actual amount of kWh returned to the grid by DG facilities, a DG performance meter as well as a standard utility meter must be utilized in UNS Electric's system. The incremental cost charged to the REST is the total cost of the performance meter in addition to the incremental cost of any net meters added as replacements for the standard utility meter.

The UCPP proposes to capture an annual meter-read for all DG systems generating electricity for compliance verification and program evaluation purposes. UNS Electric believes that many customers may also be interested in the ability to track total kWh generated by their system. To facilitate both the meter-read capture requirement and to assist customers track the kWh production by the DG system, UNS Electric plans to install and read the system performance meter for all participants in the program. The only costs charged to the REST are those costs associated with providing the second meter to record system production. There are also incidental material costs associated with the program including, but not limited to, system locks, tags, inspection tools and transportation for inspection personnel.

UNS Electric may also install an interval-recording meter on a certain number of sites that will be used by load research to conduct studies on the coincidence of solar output vs. UNS Electric system load. The only material cost charged to the REST Implementation Plan Program will be the incremental costs of the interval recording meter.

#### **c. Technological Improvements Required**

For UNS Electric to effectively and efficiently implement the DG incentive program, it will be necessary to integrate with its existing systems, including customer billing, the program and operations databases, accounting systems, and dispatch and scheduling tools. This investment is required to ensure integrity and support the scale of the program as it is described in the Plan. The technology tools to support the distributed incentive program that UNS Electric will develop and integrate into existing systems include:

- Agreement-processing and workflow-management tools — These tools will provide an interface through the uesaz.com website to allow customers and vendors to complete and submit all program forms and agreements on-line, with data to be stored in a central database. They will include an integrated workflow-management component to provide status tracking, work orders, and scheduling. The tools will also integrate into all major systems, including the billing system, and the operations and accounting databases.
- Performance information tools — The readings from the system performance meter will be integrated into the UNS Electric billing system.
- Meter Database Management — The readings from the bi-directional meter will be integrated into the UNS Electric billing system. The credit for the energy sold back to the UNS Electric system will be calculated within the billing system and will appear on the customer's standard UNS Electric bill.
- Reporting and maintenance — Data capture necessary for ongoing program monitoring and compliance reporting will be facilitated by developing standard reports and a reporting tool for *ad hoc* queries.

#### **F. Renewable Technology Commercialization and Integration**

UNS Electric proposes a budget allocation in the Plan for studies related to commercialization and integration of renewable resources. The purpose of this budget allocation is to enhance and accelerate the development, deployment, commercialization, and utilization of renewable resources for the benefit of UNS Electric customers.

Commercialization and integration studies to help meet the accelerated REST goals for renewable resources will be prioritized. As part of UNS Electric's long-standing commitment to renewable resources, several studies related to commercialization and integration are already underway. Those studies and ongoing experience with renewable resources will help identify additional study subjects necessary to achieve program goals.

The activities undertaken as part of this program may be supported either by UNS Electric solely, or in partnership with other organizations and entities including private industry, public research institutions, and government laboratories. UNS Electric intends to take full advantage of opportunities to leverage state and federal research and development efforts and supporting funding opportunities when planning and funding these activities. UNS Electric will also strive to increase coordination efforts with other utilities, the U.S. Department of Energy ("DOE"), the Arizona Department of Commerce Energy Office, and national laboratories to realize greater investment of federal research funds in Arizona and specifically the UNS Electric service territory. UNS Electric also intends to coordinate more closely with Arizona universities to better utilize those resources.

Studies presently underway that are currently funded by the EPS include:

- Arizona Renewable Resource Study — Jointly funded by Arizona Public

Service ("APS"), Salt River Project ("SRP"), and TEP/UNS Electric, the study represents an independent analysis of potential renewable resources in Arizona. The analysis is being conducted by leading energy engineering consulting group, Black and Veatch, and will effectively establish a baseline understanding of renewable energy resources presently perceived as available within the state. In addition, the study will define renewable energy technology applications, associated cost structures, as well as identify renewable energy market opportunities, which should encourage the development of renewable energy projects in Arizona. This study is complete and may be obtained upon request.

- TEP Solar Capacity Value Study — This study drives extensive research that leverages available high resolution solar generation data within Arizona and evaluates the potential for reliably incorporating utility scale and customer sited distributed solar generation into TEP's system. DOE has awarded TEP a \$100,000 grant to develop a specific solar capacity value evaluation method TEP proposed based on the data noted above. The initial report may be obtained upon request.
- Joint Utility Market Study — This joint effort will result in a statewide market study evaluating consumer receptiveness to the installation of distributed renewable energy equipment, particularly photovoltaic. Participants include APS, SRP, TEP/UNS Electric and the Arizona Cooperative Utilities.
- Concentrating Solar Power Project Studies — TEP/UNS Electric, in conjunction with several regional utilities, has formed a Joint Development Group ("JDG") to explore the possibility of issuing a joint-RFP for energy from a large-scale (250MW) solar plant. This effort is intended to provide project developers with energy and capacity levels large enough to drive cost-effective economics into the development of solar resources, in an attempt make solar generation more cost competitive with non-solar resources. The efforts of the JDG will require investment in project siting studies, along with specialized support for the development of an RFP.

In determining whether to fund new studies related to commercialization and integration, TEP/UNS Electric will consider three key functional areas:

- Renewable technologies and available resources: These include studies of the attributes, characteristics, and costs of renewable energy technologies and the availability and viability of renewable energy resources in the state of Arizona and the western United States. Specifically, TEP/UNS Electric believes it is valuable to explore geothermal resources, monitoring and forecasting of wind resources and evaluate attributes specific to solar sites for development.
- Transmission and system integration impacts: These studies would be designed to provide TEP/UNS Electric with a better understanding of

the operational impacts, costs of integration, and for the identification of opportunities with renewable energy resources in the TEP/UNS Electric generation, transmission and distribution systems. TEP/UNS Electric recognizes the critical importance of transmission in the success of the expansion of renewable generation. Any significant increase in renewable generation must be integrated into the long-term planning for transmission to be successful.

- Distribution system impacts: These studies will examine the impacts of distributed generation resources on the power distribution system. Specific areas of study would include impacts on the general distribution system, design and construction, operations and maintenance, voltage stability, safety, power quality, and load forecasting.

#### IV. COSTS OF PROGRAM IMPLEMENTATION

The UNS Electric Implementation Plan's cost is comprised of two key cost segments, renewable generation and distributed generation. A summary of the costs of those segments and the major components for each segment are included in Attachment 9. As seen in that attachment, UNS Electric currently estimates the cost to comply with the REST to range between \$4.3 million in 2008 to \$10.4 million in 2012, with a five-year total of \$35.4 million. The annual increases are driven mainly by the annually increasing energy targets.

The REST funding is intended to cover the cost of utility-scale renewable generation in excess of the market cost of conventional resource alternatives, incentive payments for distributed energy resources, marketing expenses, and program implementation and administration costs. The costs for renewable generation are based on UNS Electric's most current insights into that market. The costs for DG incentives and the program budget are based on incentives developed as part of the Commission Staff's working group and UNS Electric's best estimations of market uptake for the various technologies available to consumers.

UNS Electric is presently requesting REST Surcharge funding of \$2.1 million for 2008 under this Plan. (The current EPS adjustor would generate approximately \$0.6 million in 2008, which means the increase for the REST adjustor is about \$1.5 million above what would otherwise be collected by the EPS Surcharge.) The requested REST Surcharge amount, with approval to use the estimated end of program in 2008 of \$1.9 million of unexpended EPS funds for REST programs would total the \$2.4 million of funding needed to support the Plan with virtually no chance for compliance with the REST requirements in 2008. It is UNS Electric's intent to request additional funding in each successive year for the following calendar year's estimated REST compliance cost. To illustrate, in 2008 UNS Electric will request funding for the 2009 calendar year as part of its Implementation Plan, and carry forward that methodology in succeeding calendar years. The estimates contained in Attachment 9 would be updated each year to determine the necessary level of funding from UNS Electric's customers.

## V. CONCLUSION

Arizona is beginning the transition from a fossil-fuel based primary energy foundation to a sustainable primary energy based foundation. The transition is needed to ensure that future generations of Arizona citizens have a long-term supply of safe, affordable, convenient energy on demand. As with all transitions, the first steps are the most expensive, difficult and uncertain. Currently, all Arizona sources of renewable energy come at a cost greater than any current fossil-fuel energy source. However, due to increased use of renewable energy, the cost difference is closing and in a decade or less, renewable energy may be at economic parity with fossil fuel sources. Technical challenges to the seamless integration of time variant renewable energy sources with dispatchable generation sources have been found. But, with proper planning, continuous data analysis and deliberate technology management, the challenges can be converted to opportunities and the path to sustainable energy integration can be smooth.

The EPS adopted by the Commission in 2001 provided UNS Electric with the opportunity, and, just as importantly, sufficient funding, to develop appropriate amounts of solar technologies, both in partnership with customers and at utility scale, to understand the basic tools that will need to be developed over the next decade to fully integrate solar energy into its generation portfolio. UNS Electric's proposed REST Implementation Plan and REST Tariff, when approved by the Commission, continues that transition to sustainable energy sources by setting a definitive, sustainable timeline and providing sufficient funding to support 15 percent of annual energy needs from renewable resources by 2025.

Arizona has the nation's best solar energy resource, wherein only 0.5 percent of Arizona's land surface, if covered with ten-percent-efficient solar generation and combined with efficient, inexpensive, reliable energy storage, could provide all of Arizona's current annual electric energy needs. Solar energy is Arizona's energy future. In 2100, we hope that future Arizonans will look back in history from their end of the timeline and wonder why there was a time when solar energy was not the energy source of choice. At our end of the timeline we know that the economics and technologies are not yet fully capable of economically and reliably supporting 100 percent of Arizona's energy needs from renewable resources. Commission approval of the proposed REST Implementation Plan and its appropriate funding through the proposed REST Adjustor Mechanism and the REST Tariff will challenge UNS Electric to continue its sustainable energy transition at an accelerated pace for the next two decades. UNS Electric looks forward to working with the Commission in obtaining approval of the REST Implementation Plan and REST Tariff, in working with its customers to develop DG projects throughout the UNS Electric service area, and in developing renewable energy as a whole.



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# Attachment 1

Distributed Generation Non Solar Electric Feed In Tariff Plan - Solar Thermal, Solar Cooling, Wind, Biomass & Daylighting. Applies to all non residential solar electric in all years. UCPP	Distributed Electric Feed In Tariff Plan - Solar Thermal, Solar Cooling, Wind, Biomass & Daylighting. Applies to all non residential solar electric in all years. UCPP	Unit Built in 2015					
		Unit Built in 2016					
UNSE Generated Renewable e Power	Other RES Program Costs	Unit Built in 2017					
		Unit Built in 2018					
DG Program Subtotal	Distributed Program % of Total Program	Unit Built in 2019					
		Unit Built in 2020					
Total Program Expenses	Program Revenue Streams	Feed In Tariff Rate for 20 years \$/kWh	\$0.1800	\$0.1800	\$0.1620	\$0.1620	\$0.1380
		SubTotal Cost of Non Solar Electric Distributed Energy	\$75,606	\$177,737	\$334,999	\$577,945	\$889,836
Cumulative Program \$ Balance	Annual Program \$ Balance	Feed In Tariff	\$75,606	\$75,606	\$75,606	\$75,606	\$75,606
		Unit Built in 2008		\$102,131	\$102,131	\$102,131	\$102,131
Cumulative Program Cost	Variable Assumptions	Unit Built in 2009			\$157,262	\$157,262	\$157,262
		Unit Built in 2010				\$242,946	\$242,946
Variable Assumptions	Program Assumptions	Unit Built in 2011					\$311,891
		Unit Built in 2012					
Variable Assumptions	Program Assumptions	Unit Built in 2013					
		Unit Built in 2014					
Variable Assumptions	Program Assumptions	Unit Built in 2015					
		Unit Built in 2016					
Variable Assumptions	Program Assumptions	Unit Built in 2017					
		Unit Built in 2018					
Variable Assumptions	Program Assumptions	Unit Built in 2019					
		Unit Built in 2020					
Variable Assumptions	Program Assumptions	Feed In Tariff Rate for 20 years \$/kWh	\$0.0500	\$0.0500	\$0.0450	\$0.0450	\$0.0400
		Above Market Premium of Self Generated or Purchased Renewable Power Including Transmission After 2009	\$0.0154	\$0.0154	\$0.0154	\$0.0255	\$0.0255
Variable Assumptions	Program Assumptions	Cost of Self Generated or Purchased Renewable Power	\$424,840	\$473,402	\$571,821	\$1,101,457	\$1,237,372
		Grid Integration Rate in \$/MWh	\$0.00	\$0.00	\$0.00	\$2.00	\$3.00
Variable Assumptions	Program Assumptions	Large Scale Grid Integration Costs in \$	\$0.00	\$0.00	\$0.00	\$43,190.45	\$72,774.45
		Administrative Costs & Integration Costs & Outreach and Advertising & Net Metering costs	\$883,959	\$955,988	\$1,074,570	\$1,261,631	\$1,460,816
Variable Assumptions	Program Assumptions	Distributed Generation & DG Admin and DG Integration Program Costs	\$1,958,611	\$3,894,699	\$4,780,313	\$6,382,726	\$8,233,595
		Percent of Total RES Program Costs	82.18%	89.16%	89.32%	84.79%	86.27%
Variable Assumptions	Program Assumptions	Total REST Program Cost	\$2,383,451	\$4,368,101	\$5,352,135	\$7,527,373	\$9,543,742
		Credit Sales MWh	0	0	0	0	0
Variable Assumptions	Program Assumptions	Green Sales MWh	6	10	15	20	25
		Credit Sales \$/MWh	\$0	\$0	\$0	\$0	\$0
Variable Assumptions	Program Assumptions	Green Sales \$/MWh	\$85	\$85	\$85	\$85	\$85
		Renewable Product Sales Income	\$508	\$847	\$1,270	\$1,694	\$2,117
Variable Assumptions	Program Assumptions	EPS Carryover Revenue	\$260,000	\$500,000	\$500,000	\$500,000	\$260,000
		REST Surcharge/Sample Tariff Income	\$2,118,756	\$3,870,000	\$4,850,000	\$7,030,000	\$9,280,000
Variable Assumptions	Program Assumptions	Investment Tax Credit	\$0	\$0	\$0	\$0	\$0
		Finance Cost @ 10% or Investment @ 5%	\$0	\$419	\$102	\$178	(\$136)
Variable Assumptions	Program Assumptions	Total EPS Program Revenue	\$2,379,264	\$4,371,266	\$5,351,373	\$7,531,872	\$9,541,982
		Total EPS Program Annual Balance (Subsidy Program)	(\$4,186)	\$3,165	(\$762)	\$4,499	(\$1,760)
Variable Assumptions	Program Assumptions	Cumulative Gain (Loss) (Subsidy Program)	(\$4,186)	(\$1,022)	(\$1,784)	\$2,716	\$955
		Cumulative REST Program Expenditures	\$2,383,451	\$6,751,551	\$12,103,686	\$19,631,059	\$29,174,801
Variable Assumptions	Program Assumptions	Landfill Gas MWp	5 MWp				
		Central Solar Conversion Rate	1700 MWh/MWp				
Variable Assumptions	Program Assumptions	Distributed Solar Conversion Rate	1350 MWh/MWp				
		Distributed Renewable Conversion Rate	1000 MWh/MWp				
Variable Assumptions	Program Assumptions	Solar Thermal Conversion	2840 MWh/MWp				
		Dispatchable Conversion Rate	8760 MWh/MWp				
Variable Assumptions	Program Assumptions	Wind Conversion Rate	1925 MWh/MWp				
		OG Energy Rating					

#### Assumptions:

UNSE manages the Distributed Generation Program  
60% of residential distributed is solar electric. The other 40% is solar hot water and wind. Paid for with up front subsidy through 2012  
25% of Commercial distributed is solar electric. The other 75% is solar hot water heating, solar cooling, wind, biomass or daylighting. Paid for with a 20 year locked feed in tariff after 2007 through 2030.  
The cost of renewable energy purchased through RFPs and generated by UNSE in the future initially will be \$0.0154 per kWh above the market price for energy purchased at the same time the renewable energy was generated.  
The cost of transmission after 2012 to bring the needed amounts of 50% wind to UNSE will be based on a transmission cost of \$0.035 cents per kWh on a 20% capacity factor line, in 2013 with reduction to market in 2030.  
All renewable generation sources for UNSE can be integrated into the existing transmission structure through 2012.  
This scenario does not include reductions from Global Solar credit production.  
Energy sales and subsidy revenue growth is 2.72% per year. Assumes the REST reduces customer energy load growth due to the new self generation in and DSM reduces load growth also.  
Annual energy production rates for the various technologies are based on historical data from the first five years of the UNSE EPS programs.  
The Feed In Tariff program has less risk of problems associated with customer generation production than the Up Front Subsidy Program given that there Grid Integration Costs based on Xcel/Minnesota Dept of Commerce Report of 2004, Idaho Power Report in 2007 and British report of 2006.  
Other REST Program Costs include: Interconnection application review costs, net metering costs, application processing costs, initial inspections, annual hearing costs.  
There is no energy storage anticipated during the 2008 through 2015 time frame. Storage will be needed after 2015 if unpredictable energy sources like  
Administrative costs assume one person per 500/kWp per year of new commercial or residential solar installations and two technical gurus for all levels of  
Ongoing annual inspection and repair work will be contracted out.  
Creation of a database with online access for customers and installers will add some cost in future.



# Renewable Energy Standard per 11/2006 Approved REST Rule. Sample Tariff Funding Plan

UNSE-600

UNSE & REST Program  
Factors

Renewable Resource Energy and Power Conversion

Annual  
Credit  
Balance  
es MWh

Assumption

Residential Solar  
Electric Up Front  
Subsidy Payment  
UCPP Plan

Distributed Solar  
Hot Water & Wind  
Up Front Subsidy  
Payment UCPP  
Plan

Assumption

Generation Solar  
ed In Tariff Plan -  
non residential solar  
all years. UCPP

Item	2008	2009	2010	2011	2012
RES Annual Renewable Energy Percentage	1.75%	2.00%	2.50%	3.00%	3.50%
Energy Sales - MWh Growth @ 2.72%/yr	1,762,733	1,826,544	1,881,244	1,945,323	2,015,532
Expected DSM Program Annual Energy Reductions	3,815	7,810	11,948	16,428	20,878
Expected DG Program Annual Energy Reductions	0	3,078	5,447	9,319	14,397
Net Retail Energy Sales in MWh per Year	1,758,918	1,815,656	1,863,849	1,919,576	1,980,257
Renewable Energy - MWh	30,781	36,313	46,596	57,587	69,309
Minimum Distributed Energy %	10.00%	15.00%	20.00%	25.00%	30.00%
Minimum Distributed Energy MWh	3,078	5,447	9,319	14,397	20,793
Minimum Residential Distributed Energy %	3.45%	7.50%	10.00%	12.50%	15.00%
Minimum Residential Distributed Energy MWh	1,062	2,723	4,860	7,198	10,396
Maximum Commercial Distributed Energy %	6.55%	7.50%	10.00%	12.50%	15.00%
Maximum Commercial Distributed Energy MWh	2,016	2,723	4,860	7,198	10,396
Residential Distributed Generation - MWp Total New 80% Solar PV	0.232	0.970	1.831	2.959	4.381
Residential Distributed Energy - MWp Total New 40% Solar Hot Water/Space Heating & Wind	0.425	1.089	1.864	2.879	4.159
Commercial Distributed Generation - MWp Total New 25% Solar Electric PV	0.296	0.401	0.685	1.059	1.529
Commercial Distributed Generation - MWp Total New 75% Non Solar Electric @ ave 50% CF	0.345	0.466	0.798	1.233	1.780
Distributed Solar Elect MWp Old With Multipliers	0.24	0.24	0.24	0.24	0.24
Utility Solar Elect MWp Old With Multipliers	0.02	0.02	0.02	0.02	0.02
Utility Fueled Generation - MWp Old With Multipliers	0.000	0.000	0.000	0.000	0.000
Utility Generated @ 80% NonDispatchable Energy - MWp New No Multipliers - Wind	11.500	12.815	15.479	17.937	20.150
Utility Generated @ 20% Fueled - MWp New No Multipliers	0.632	0.704	0.850	0.985	1.107
Resulting Total Solar Electric Capacity in MW	0.776	1.488	2.633	4.135	6.027
Resulting Total Solar Electric Annual Energy in MWh	2,316	3,490	5,135	7,293	10,011
Incremental Solar Capacity Watts Installed per Year per Person	2,936	3,953	6,362	8,343	10,509
Resulting Total Distributed Solar Hot Water Heating Capacity in MW	0.929	1.770	3.029	4.679	6.758
Resulting Total Distributed Solar Water Heating Annual Energy in MWh	929	1,770	3,029	4,679	6,758
Resulting Total Distributed Non Solar Electric Dispatchable or Displaced Generation Capacity in MW	0.230	0.311	0.532	0.822	1.187
Resulting Total Distributed Non Solar Electric Dispatchable or Displaced Generation Annual Energy in MWh	1,008	1,362	2,330	3,599	5,198
Resulting Total Wind Electric Generation Capacity in MW	11.500	12.815	15.479	17.937	20.150
Resulting Total Wind Electric Generation Annual Energy in MWh	22,138	24,669	29,798	34,528	38,789
Resulting Total Biomass Electric Generation Capacity in MW	0.632	0.704	0.850	0.985	1.107
Resulting Total Biomass Electric Generation Annual Energy in MWh	5,535	6,167	7,449	8,632	9,697
Total Renewable Generating Annual Energy in MWh	31,926	37,458	47,741	58,732	70,454
Total Renewable Generating Capacity in MW	14.068	17.088	22.524	28.558	35.228
Residential Distributed Electric Credit Balance	0	0	0	0	0
Commercial Distributed Energy Credit Balance	0	0	0	0	0
Utility Generated Electric Credit Balance	1,494	1,484	1,469	1,449	1,424
Residential Distributed Generation Solar Electric %	60.00%	60.00%	60.00%	60.00%	60.00%
Residential Distributed Generation Up Front Solar Electric Subsidy Program \$/Watt DC	\$3.00	\$3.00	\$3.00	\$3.00	\$3.00
Additional Residential Distributed Solar Electric Capacity Needed in MWp this given Year	0.232	0.738	0.861	1.128	1.421
Subtotal Cost of Residential Distributed Solar Electric Subsidies	\$695,929	\$2,215,383	\$2,581,518	\$3,385,049	\$4,263,921
Residential Distributed Solar Hot Water & Wind Up Front Subsidy Program \$/Watt AC Equivalent	\$0.5000	\$0.5000	\$0.5000	\$0.5000	\$0.5000
Additional Residential Distributed Solar Hot Water & Wind Capacity Needed in MWp this given Year	0.425	0.665	0.774	1.016	1.279
Subtotal Cost of Residential Distributed Solar Hot Water & Wind Subsidies	\$212,389	\$332,307	\$387,228	\$507,757	\$639,588
Distributed Generation Solar Electric %	25.00%	25.00%	25.00%	25.00%	25.00%
SubTotal Cost of Distributed Solar Electric Generation Feed In Tariff	\$90,727	\$213,284	\$401,999	\$693,534	\$1,052,208
Unit Built in 2008	\$90,727	\$90,727	\$90,727	\$90,727	\$90,727
Unit Built in 2009		\$122,557	\$122,557	\$122,557	\$122,557
Unit Built in 2010			\$188,715	\$188,715	\$188,715
Unit Built in 2011				\$291,536	\$291,536
Unit Built in 2012					\$358,674
Unit Built in 2013					
Unit Built in 2014					



# Attachment 2

## **Conceptual Development of Market Cost of Comparable Conventional Generation for the proposed Renewable Energy Standard & Tariff**

Consistent with the Renewable Energy Standard & Tariff ("REST") Rules passed by the Arizona Corporation Commission ("Commission"), UNS Electric, Inc.'s ("UNS Electric") proposed Renewable Energy Standard and Tariff Implementation Plan contemplates recovery of expenses in excess of the Market Cost of Comparable Conventional Generation ("MCCCG"). The Commission provided guidance on defining MCCCG in the context of its REST Rules and identified the MCCCG as "the Affected Utility's energy and capacity cost of producing or procuring the incremental electricity that would be avoided by the resources used to meet the Annual Renewable Energy Requirement, taking into account hourly, seasonal and long term supply and demand circumstances. Avoided costs include any avoided transmission and distribution costs and any avoided environmental compliance costs." R14-2-1801.11.

The great bulk of Renewable Energy Standard program expenses are expected to be from procurement of renewable energy generation sources, both customer sited distributed generation and remote utility scale sources through purchased power agreements. There may be some internal renewable generation production sources built if the cost of purchased renewable energy is higher than self built options. The recovery of all expenses through the REST Tariff revenues will, to a very large degree, be affected by the methodology used to derive the MCCCG amount, expected to be an annual number. This document is intended to define the methodology for purchased power or for internally owned renewable generation sources. It may also be used as a comparison point for customer sited distributed renewable generation resource cost recovery.

The proposed method assumes that an annual revenue requirement figure will be built up as a sum from a series of 8,760 (8,784 in a leap year) hourly figures comparing actual renewable generation resource costs for each renewable energy resource purchased or self produced in each hour of the year against the MCCCG in those same hours. The comparable hourly MCCCG may be different for different renewable sources, taking into account the firmness of the renewable generation resource, the curtailability of the renewable generation resource and whether native load requirements were met by internally owned or contracted generation resources or if market purchases were required to meet native load requirements. The following table provides a MCCCG evaluation matrix. The hourly MCCCG cost determination criteria is listed in the box selected by comparing the types of Purchased Renewable Generation with the Market Condition and Dispatch Type. This method of cost determination is very data intensive and will be evaluated at the end of each year by running UNS Electric's PROMOD model software against the purchased renewable generation. The cost of the purchased renewable generation above MCCCG costs will be included in the REST Adjustor Mechanism and REST Tariff.

## MCCCG Cost Determination Matrix

Types of Purchased Renewable Generation					
Market Condition and Dispatch Type		Dispatchable Firm Renewable Generation: Fuel/Solar hybrid, Wind/Hydro hybrid, Biomass	Must Run Firm Renewable Generation: Dedicated Landfill Gas or Biogas	Must Run Non-Firm Renewable Generation: Run of Canal or River Hydro	Curtailable Non Firm Renewable Generation: Wind or Solar without firming storage
	Selling to Market from In House Real and Contracted Generation Sources	MCCCG Cost Based on Incremental Production/Purchase Cost of Base Load Generation for that hour			
	No Market Transactions from/to In House and Contracted Generation Sources				
	Purchasing from Day Ahead Market, but not Spot Market, to meet Native Load Requirements	MCCCG Cost Based on Average Day Ahead Market Price of Purchased Power for that hour			
	Purchasing from Spot Market to meet Native Load Requirements	MCCCG Cost Based on Average Spot Market Price of Purchased Power for that hour			

Incremental Production / Purchase of Base Load - The cost of the next kWh (incremental) amount of load that has to be provided by TEP generation sources and/or purchased power. This will be dependent on the season, month and time of day.

If Day Ahead Market or Spot Market purchases are being used to provide for reliability support capacity to meet native load requirements by freeing up in house or contracted generation resources for regulation or spinning reserve purposes for support of native load requirements, that would still represent a Market Purchase for purposes of determining which matrix box is applicable.



# Attachment 3

**REDACTED**



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# Attachment 4

**REDACTED**



# Attachment 5

**REDACTED**



# Attachment 6

**REDACTED**



# Attachment 7

**UNS Electric, Inc.**

**2006 Annual Report on  
Environmental Portfolio Standard Programs**

**Prepared for:  
Arizona Corporation Commission**

**Submitted: April 1, 2007**



## EPS Activity Summary

Pursuant to the Arizona Corporation Commission ("Commission") Order in Docket No. E-04204A-04-0304, Decision No. 67178, UNS Electric, Inc., a subsidiary of UniSource Energy Services ("UNS Electric") (formerly Citizens Communication Company, Mohave Electric Division and Santa Cruz Electric Division ["Citizens"]) presents its annual report on Environmental Portfolio Standard ("EPS") programs for the period covering January 1, 2006 through December 31, 2006.

Based on the percentage requirements of the portfolio standard, the following chart of MWh requirements has been used to forecast the UNS Electric EPS annual renewable energy needs:

EPS MWh Requirements

Year	UNSE/Citizens' Retail MWh Sales	EPS %	EPS MWh Required	Accumulated EPS MWh Required
Actual				
2001	1,275,036	0.20	2,550	2,550
2002	1,136,581	0.40	4,546	7,096
2003	1,392,466	0.60	8,355	15,451
2004	1,462,633	0.80	11,701	27,152
2005	1,520,947	1.00	15,209	42,361
2006	1,611,420	1.05	16,920	59,281
Projected				
2007	1,659,763	1.10	18,257	77,538
2008	1,709,555	1.10	18,805	96,343
2009	1,760,842	1.10	19,369	115,712
2010	1,813,667	1.10	19,950	135,662
2011	1,868,077	1.10	20,549	156,211
2012	1,924,120	1.10	21,165	177,376
Total	19,135,107		177,376	912,733

Surcharge revenues and program expenditures applicable for 2006 are summarized in Table 1. EPS energy totals for 2006 and program to date are shown in Table 2. The energy (kWh) output from UNS Electric's on-site photovoltaic stations is outlined in Table 3.

**Table 1**

**Summary of EPS Programs  
Period from January 1, 2006 through December 31, 2006**

<b>Summary of Program Revenues</b>			
Description	Thru 12/31/05	Period 1/01/06 - 12/31/06	Life of Program
GreenWatts Total	\$3,973	\$6,302	\$10,275
Renewables Surcharge Total	\$2,270,053	\$550,207	\$2,820,260
Total EPS Program Revenues	\$2,274,026	\$556,509	\$2,830,535
<b>Summary of Program Expenditures</b>			
Hardware Buydown Program	\$62,878	\$168,051	\$230,929
Landfill Gas Credits	\$467,000	\$173,250	\$640,250
Marketing	\$19,235	\$20,060	\$39,295
Materials & Supplies	\$167	\$1,159	\$1,326
Outside Services & Contracting	\$400	\$4,589	\$4,989
Payroll	\$18,316	\$39,017	\$57,333
TEP Support Services	\$9,487	\$0	\$9,487
Training & Travel	\$967	\$6,358	\$7,325
Total EPS Renewables Expenditures	\$578,450	\$412,484	\$990,934
<b>Program Balance</b>			
	\$1,695,576	\$144,025	\$1,839,601

**Table 2**  
**Summary of EPS Energy Totals**  
**Period from January 1, 2006 through December 31, 2006**

Description	Cumulative Thru 12/31/05	Reporting Period 1/1/06 - 12/31/06	Cumulative Thru 12/31/06
Retail Sales, kWh	5,281,925,000	1,611,420,000	6,893,345,000
UES EPS Requirement (1.05% of retail sales for 2006), kWh	28,672,900	16,919,910	45,592,810
"Other" Credits Needed To Meet EPS Requirements (40% in 2006), kWh	11,469,160	6,767,964	18,237,124
"Solar Electric" Resource Credits Needed to Meet EPS Requirements (60% in 2006), kWh	17,203,740	10,151,946	27,355,686
"Solar Electric" Resource Credits Generated, kWh (Note 1)	337,476	221,190	558,666
"Solar Electric" Resource Credits Purchased, kWh (Note 1)	0	0	0
"Other" Credits Generated, kWh	0	0	0
"Other" Credits Purchased, kWh	18,680,000	6,930,000	25,610,000
Total "Solar Electric" Credits, kWh	337,476	221,190	558,666
Total "Other " Credits, kWh	18,680,000	6,930,000	25,610,000
Excess "Solar Electric" Credits Above Meeting EPS Requirements, kWh	-16,290,916	-16,698,720	-32,989,636
Excess "Other" Credits Above Meeting EPS Requirements, KWH	1,819,200	162,036	1,981,236

(Note 1) Includes extra credit multiplier, 2.0 for 2006

**Table 3**  
**EPS Solar Energy Production**  
**Period from January 1, 2006 through December 31, 2006**

KG	LH	NO	
		30	
	649		
		0	
	5,182		
	3,519		
2,518			
2,650			
18,780			
4,597			
	4,746		
	7,773		
	3,369		
	2,836		
	4,462		
	2,124		
	4,336		
	9,211		
	1,374		
	5,065		
	4,751		
5,367			
	571		
4,893			
3,706			
4,965			
	1,062		
	2,708		
47,476	63,089	30	kWh
		<b>110,595</b>	kWh

Total actual kWh generated for the year:  
110,595\* 2.0 multiplier (in-state credits, distributed generation) = 221,190 kWh

Cumulative Solar kWh generated:

Year	kWh	Multipliers .5 Early Installation .5 In-State Installation .5 Distributed Generation	Total EPS kWh
1998	19,000	2.5	47,500
1999	19,000	2.5	47,500
2000	19,000	2.5	47,500
2001	19,000	2.5	47,500
2002	19,400	2.5	47,500
2003	13,333	2.0 (Early Install Multiplier Ended)	26,700
2004	9,978	2.0	19,956
2005	26,738	2.0	53,476
2006	110,595	2.0	221,190
Total			558,822

### SOLAR PROJECTS TO DATE

Two solar projects were initiated in 1997. The two systems installed by Citizens were part of a pilot project undertaken in partnership with a TEAM-UP utility working group. The group received funds from the federal Department of Energy through a partnering program with the Utility Photo Voltaic Group.

This solar project includes two sites:

Lake Havasu City:

- 2 Systems
- Each system comprised of 12 panels for a total of 24 panels
- Site output is approximately 4 kW
- Grid connected (no battery storage)

Kingman:

- 2 systems
- One system is comprised of 13 panels, the other has 14 for a total of 27 panels
- Site output is approximately 4 kW
- Grid connected (no battery storage)

In addition, to further meet the EPS requirements, UNS Electric purchased 6,930 MWh of Landfill Gas Credits from Tucson Electric Power (TEP), issued under EPS Credit Certificate No. TEP/UNSE - 004. With this purchase, UNS Electric will carry a credit surplus of 1,981 MWh of "Other" credits into 2007.

UNS Electric received approval from the Arizona Corporation in August 2004 for the GreenWatts and SunShare Programs. Since the inception of the SunShare Program, twenty-five customers have received \$230,929 in subsidies through 2006.



# Attachment 8

**UNS Electric, Inc. Uniform Credit Purchase Program**

**Sample Tariff Funding Plan**

**Renewable Energy Credit Purchase Program**

**(RECPP)**

**Definition**

## **UNS Electric, Inc. Renewable Energy Credit Purchase Program (RECPP)**

UNS Electric, Inc. ("UNS Electric") is committed to assisting our customers develop their own renewable generation resources, through a balanced and supportive renewable energy distributed generation incentive program. Our goal is to create a program that will provide incentives for affordable, environmentally sensitive, customer-sited renewable energy generation systems to supplement UNS Electric customer's energy needs. A properly designed system, matched to a customer's energy use, will provide a reduction in utility bills through the use of renewable resources. This program reflects our commitment to reduce the cost of developing renewable energy resources in partnership with our customers and help provide our customers with clean energy options.



## Defined Terms

**ACC** – Arizona Corporation Commission.

**AZROC** – Arizona Registrar of Contractors.

**Applicant** – Utility customer of record for the Utility Revenue Meter located at the installation site; a builder of the structure (residential or non-residential) who will reserve and install the Qualifying system; or for an off-grid Qualifying System, the property owner for the installation site located within a Utility's service territory.

**Arizona Business License** – A business license issued by the ACC.

**Cancelled** – Reservation Status indicating that a Reservation has been terminated, funding is no longer allocated, and the utility has removed the reservation from the funding queue.

**Cancellation** – The termination of the Reservation.

**Commissioned** – Qualifying System certified to be in operation.

**Commissioning Package** – Written verification signed by the installer and the customer confirming that the system has been installed in conformance with the approved reservation and that the system is ready for operation.

**Conforming Project** – Any project utilizing a renewable technology listed in Attachment D.

**Conformance Inspection** – Inspection performed by the utility to verify that the system has been installed and operates in conformance with the Reservation application.

**Customer** -- Utility customer of record for the Utility Revenue Meter located at the installation site or a builder of the structure (residential or non-residential) who will reserve and install the Qualifying System.

**Extension** – The extension of the Reservation Timeframe.

**Installer** – The entity or individual responsible for the installation of a qualifying system.

**Interconnection Inspection** – Inspection performed by the utility to confirm that the system can be safely interconnected to the power grid.

**Non-Conforming Project** – Non-conforming projects include, but are not limited to, projects with staged completion dates, multi-customer or multi-system projects, projects involving more than one technology, projects requiring new or unique agreement terms, projects with technologies for which qualification standards have not been developed or projects requiring non-standard timeframes.

**Performance Based Incentive (PBI)** – Incentive based on a rate per kWh output or equivalent kWh of energy savings.

**Project Costs** – System Costs plus financing costs.

**Proof of Project Advancement** – Documentation demonstrating that a project is progressing on schedule and is staged for Commissioning on or before the end of the Reservation Timeframe.

**Qualifying System** – Distributed renewable energy systems meeting the qualifications for production of qualified Renewable Energy Credits in Arizona acceptable to the Arizona Corporation Commission as they may be defined for affected utilities to meet any renewable energy standards.

**Renewable Energy Credit (REC)** – One Renewable Energy Credit is created for each kWh, or kWh equivalent for non-generating resources, derived from an eligible renewable energy resource. RECs shall include all environmental attributes associated with the production of the eligible renewable energy resource.

**Reservation** – A dollar amount committed by the utility to fund a project if all program requirements are met.

**Reservation Status** – Indicator relating to approval or denial of a Reservation request. If a Reservation is approved, the Reservation Status is Reserved. If a Reservation request is denied, the Reservation Status is either Cancelled or Wait Listed.

**Reserved** – Status indicating the acceptance of a Reservation request.

**Reservation Timeframe** – The duration of the utility's funding commitment for a Reservation.

**System Costs** -- Costs associated with the Qualifying System components, direct energy distribution, system control/metering, and standard installation costs directly related to the installation of the Qualifying System.

**Up Front Incentive (UFI)** – One time incentive payment based on system capacity or estimated energy kWh production rather than on measured system output.

**Wait List** – Status indicating Applicant has met program requirements, but the Utility has insufficient funding to commit to funding the project.

## **UNS Electric Renewable Energy Credit Purchase Program (RECPP) Review Panel**

UNS Electric will participate in a RECPP Review Panel for ongoing review and modification of all Renewable Distributed Generation programs, as prescribed by the ACC. UNS Electric believes that the Review Panel making recommendations to expeditiously modify all UNS Electric renewable programs is critical to its ultimate success. Program elements may need to be adjusted to reflect new information, changing market conditions, incorrect initial assumptions, or technological innovations.

### **Panel Structure and Function**

The Review Panel will be a five member panel created and maintained to provide on-going review of all renewable distributed generation program modifications and to efficiently facilitate incorporation of features that increase program efficacy as more information is gained by program implementation. The panel will make recommendations to the UNS Electric Renewable Energy program management for review and potential program incorporation.

The panel make-up includes one representative from the ACC staff, two representatives from the Mohave County and/or Santa Cruz County area renewable distributed generation industry, and two representatives from UNS Electric. The industry representatives should not exceed one each from a technology type and should reflect the diversity of technologies and consumer types available in the Mohave County or Santa Cruz County areas.

No renewable distributed generation industry representative shall serve more than one four year term.

The Review Panel shall make recommendations for consideration on the following subjects:

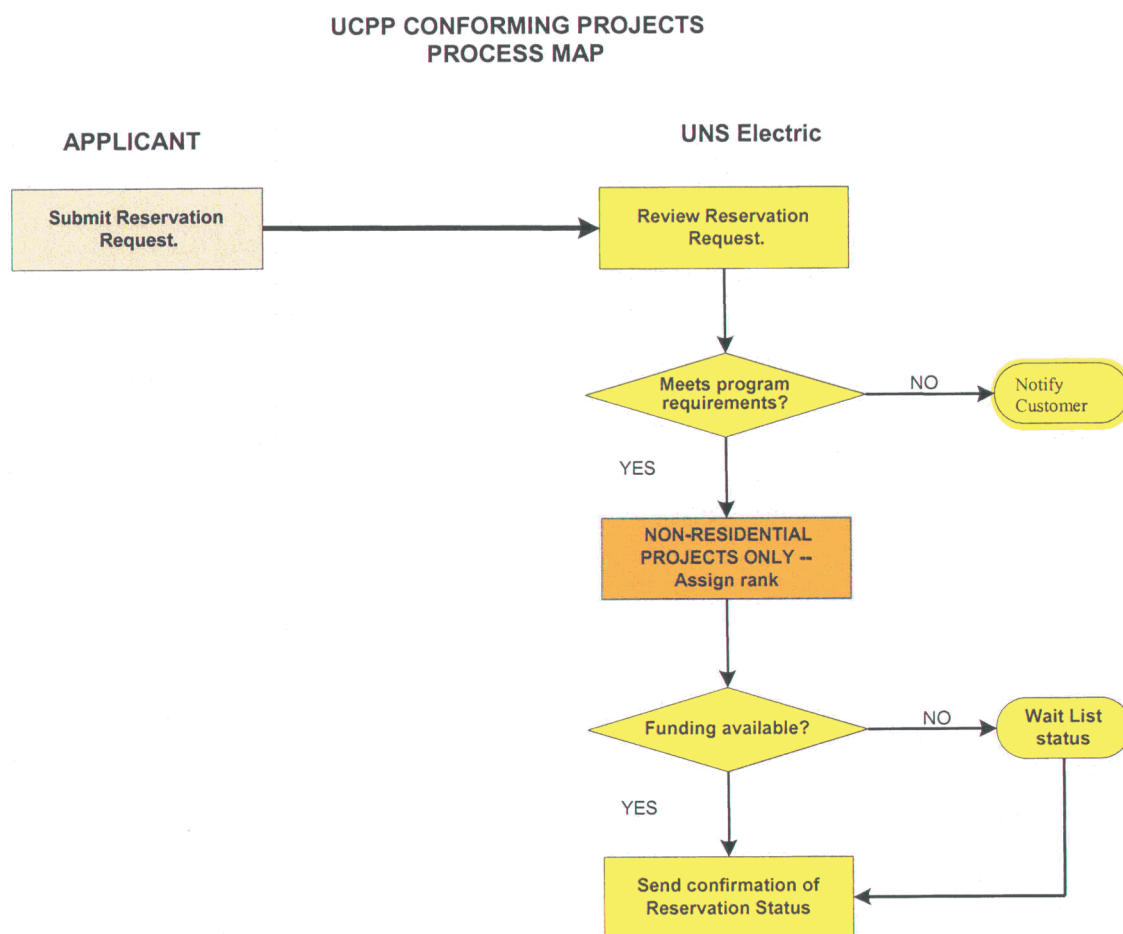
- Adjustment of incentive structures to reflect market response
- Process related issues that affect market function
- Development of new conforming incentives, as necessary
- Arbitration of incentive or program borne conflicts

The Review Panel should meet twice per year (or more often as necessary) to assess the items related to the above-described purpose. The Review Panel will review input from stakeholders on items before it for consideration, and it is anticipated that on occasion stakeholders may be consulted by the Review Panel to provide additional input. Upon full consideration of an item, the Review Panel will vote on adoption of the specified recommendation. A super-majority majority vote of at least four affirmative votes on a subject would result in a recommendation for consideration and potential incorporation into the RECPP. UNS Electric requests Commission approval of authority to implement unanimous five affirmative vote recommendations of the Review Panel without further Commission review and approval. For conditions where a unanimous vote is not achieved, the Commission will have the final approval authority.

## Process Map – Conforming Projects

UNS Electric mapped the RECPP process for conforming projects to illustrate the flow of information between the applicant and UNS Electric. The following sections reflect the recommended process flow.

### Step 1 – Reservation Request and Assignment of Reservation Status



#### Process Map Description – Step 1

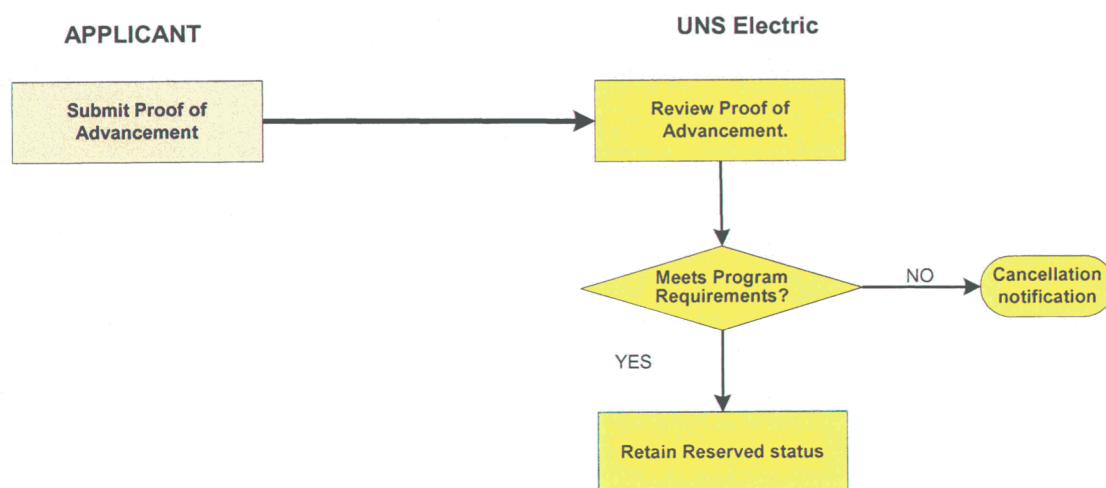
The first input UNS Electric receives from the customer is the reservation request. UNS Electric will review the reservation request to ensure the application conforms to program requirements. Residential reservation requests are processed on a first-come, first-served basis. Non-residential reservation requests are assigned a rank based on the lowest expected life cycle credit purchase cost. Additional detail on non-residential reservations is provided in the incentives section of this report.

After reviewing the reservation request, UNS Electric will assign a reservation status. If the reservation request is approved, UNS Electric will send a confirmation to the applicant. If the reservation request is denied because the request is not in compliance with program requirements, UNS Electric will send notification to the applicant of the discrepancies and that the request will be cancelled. Similarly, if the

reservation request is denied because funding is not available, UNS Electric will send a notification to the applicant that the request will be placed on a waiting list.

Residential reservation requests will be reviewed within 30 days of the utility's receipt of the request. Non-residential reservation requests will be reviewed within 90 days of UNS Electric's receipt of the request. Further detail relating to reservation periods is provided under the section titled Incentive Allocation.

### Step 2 – Proof of Advancement Process Map



#### Process Map Description – Step 2

The applicant must submit proof of advancement to UNS Electric to retain his or her reservation within the timeframes outlined below. At a minimum, the Proof of Project Advancement documentation for a non-residential application greater than 20 kWac will include:

- A project agreement (between customer and installer);
- An executed installation agreement including all project participants;
- Building and/or construction permits and/or a full set of design development or construction drawings (80% or more complete); and
- An executed interconnection agreement (if applicable).

Residential customers and non-residential customers installing a renewable energy system with rated production capacity of 20 kWac or less must provide copies of City/County construction permits to UNS Electric.

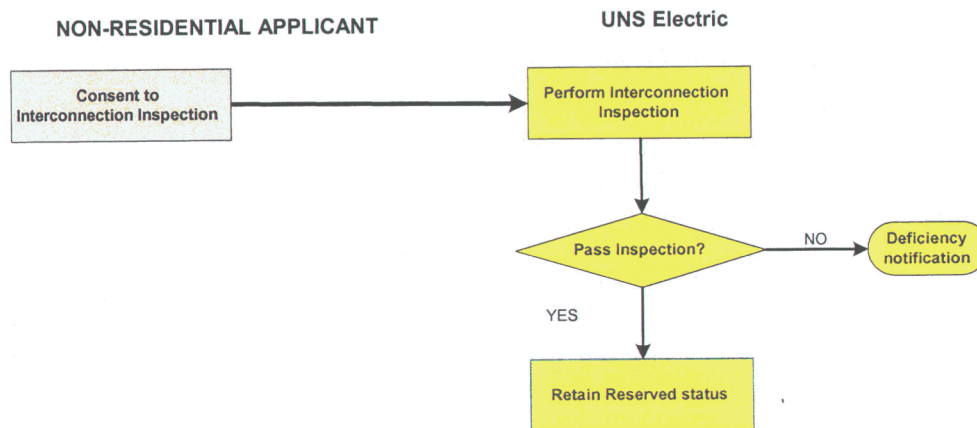
The timeline for proof of project advancement is based on the date of reservation confirmation and must be provided by the customer in accordance with the following schedule:

**Residential**

60 Days

**Non-Residential  $\leq 20,000$  watts  
AC capacity equivalent  
60 Days****Non-Residential  $> 20,000$   
watts AC capacity equivalent  
120 Days**

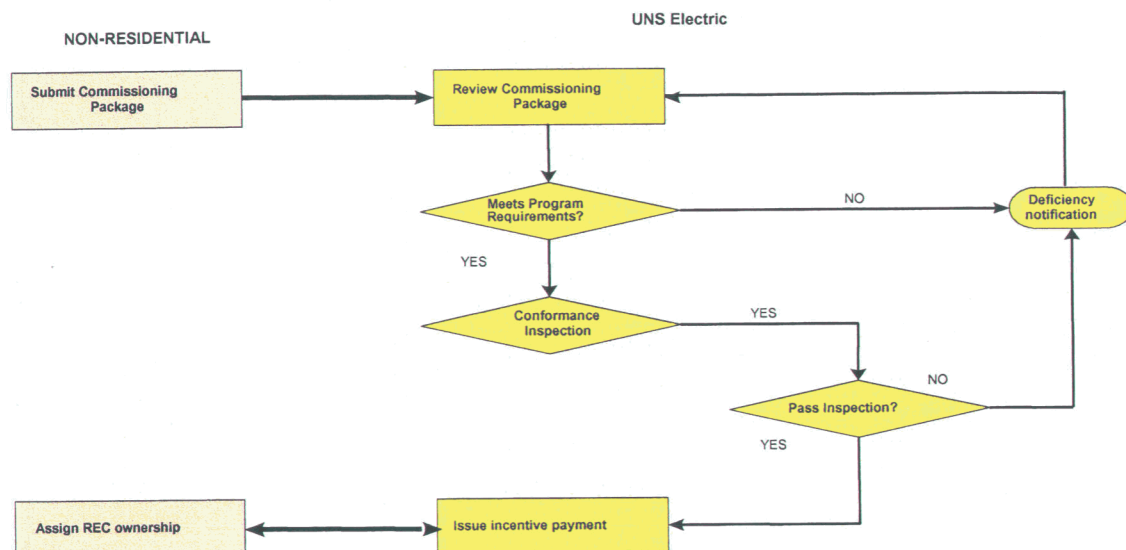
If proof of project advancement is not received within the specified timeframe, the customer will be notified that the reservation is cancelled. The applicant has the option to reapply for funding after the reservation has been cancelled. The request will be processed in the same manner as a new project reservation and will be contingent upon availability of funding.

**Step 3 – Interconnection Inspection (for Grid-Tied Qualifying Systems with capacity larger than 20 kWac)**Process Map Description – Step 3

Non-residential grid-tied qualifying systems of electrical generating capacity larger than 20 kWac must submit to and pass an interconnection inspection before the system can be commissioned. UNS Electric conducts the interconnection inspection and will notify the applicant of the results of the inspection. If the system passes the inspection, the application retains the reservation. The applicant can keep the reservation even if the system fails the initial inspection, as long as the deficiency is remedied within the defined reservation timeframe described in Step 2.



## Step 4 – System Commissioning For Non-Residential Systems with capacity Larger Than 20 kWac



### Process Map Description for System Commissioning Non-Residential Customers – Step 4

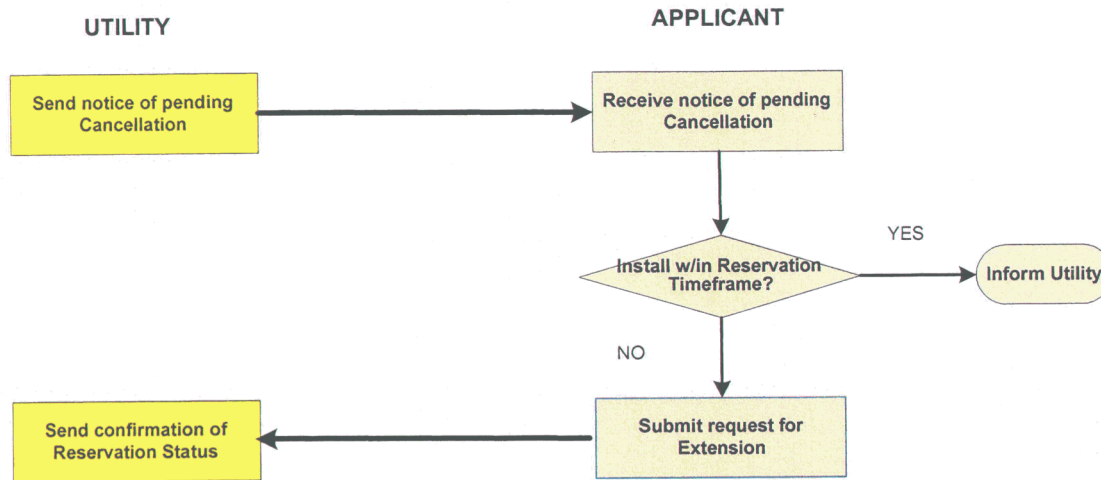
After the Non-Residential system has been commissioned, the applicant must submit a commissioning package to UNS Electric. UNS Electric will review the commissioning package and confirm that all program requirements have been met, including passing the interconnection inspection. For systems with capacity larger than 20 kWac, UNS Electric may, at its discretion, perform a conformance inspection of the system. UNS Electric will notify the applicant of the scheduled conformance inspection and the applicant must make the system available for inspection. In some cases, an incentive payment may not be issued until after a qualifying system has passed the conformance inspection.

Residential customers and non-residential customers with systems of capacity 20 kWac and less will notify UNS Electric that their installation is complete. UNS Electric will perform an acceptance test to verify installation and system performance after receiving copies of City/County permit.

Residential customers and non-residential customers with systems of capacity 20 kWac and less, who are receiving a UFI payment, and have met all program requirements, will receive the incentive payment within thirty days of successful acceptance. After UNS Electric issues the UFI payment to the applicant, UNS Electric is assigned exclusive rights to all the RECs associated with the generation produced from the qualifying system for a period of at least twenty years.

Systems receiving PBI payments will report production, receive payment, and release all RECs in conformance with the detail described in this report under the sections titled *Procedures for Production Based Incentives and Distributed Generation Incentives*.

## Conditionally Required Step - Cancellations



### Process Map Description – Cancellations

Unless an extension is granted, as described below, a reservation request will be cancelled if all program requirements have not been met with the reservation timeframe.

The reservation timeframe is determined in accordance with the following schedule:

<b>Residential</b>	<b>Non-Residential <math>\leq</math> 20,000 watts ac capacity equivalent</b>	<b>Non-Residential <math>&gt;</math> 20,000 watts ac capacity equivalent</b>
180 Days from Reservation Confirmation Date	180 Days from Reservation Confirmation Date	365 Days from Reservation Confirmation Date

UNS Electric will notify the applicant of the pending cancellation in accordance with the following schedule:

<b>Residential</b>	<b>Non-Residential <math>\leq</math> 20,000 watts ac capacity equivalent</b>	<b>Non-Residential <math>&gt;</math> 20,000 watts ac capacity equivalent</b>
30 Days Prior to Cancellation	30 Days Prior to Cancellation	60 Days Prior to Cancellation

### Extensions

UNS Electric will grant an extension for up to 90 days following timely receipt of a customer's request for extension. UNS Electric may approve written extension requests detailing the conditions for delay for periods beyond 90 days under extenuating circumstances.

### Operations Monitoring

All customers receiving renewable energy self-generation incentives are obligated to report system production to UNS Electric in accordance with the reporting schedule established in the program



agreement between UNS Electric and the customer. UNS Electric, at its option, may perform periodic inspection of the system for operation, metered production, and reporting purposes.

### **Procedures for Production Based Incentives**

Each project eligible for a PBI requires a project agreement between the applicant(s) and UNS Electric that will detail the assignment of energy and RECs and the assignment of payment. All PBI Project Agreements will include the following requirements:

1. Meters certified according to the UNS Electric standards that provide readings in kWh will be provided by UNS Electric as part of the system commissioning package.
2. Quarterly meter reads will be performed by UNS Electric and quarterly payments will be made to the assigned payee within 30 days, based on quarterly kWh production. If the payment due is less than \$25.00, it will be held for the next payment period.
3. PBI payments will begin with the first quarterly production following receipt of the completed system commissioning package and commissioning test, if required, and continue for the life of the agreement term. As part of this provision, it is understood that systems commissioned mid-quarter will receive payment only for the production of that partial quarter.

### **Installer Qualifications**

All systems receiving incentives under the RECPP must be installed by a qualified installer. The following requirements must be submitted by the applicant as part of the reservation request. UNS Electric will verify that the installer meets the following minimum qualifications prior to confirming a reservation request:

1. The installer must possess a valid license on file with the AZROC with a license classification appropriate for the technology being installed or the installer must identify use of a contractor holding an appropriate license on file with the AZROC for the technology being installed. A copy of the AZROC license must be provided as part of the reservation request.
2. The installer must possess an Arizona business license that is active and in good standing.

Installers may request that the above information be retained on file with UNS Electric; however, under this option the installer must certify that the information on file remains current with the submission of each reservation request. Information on file must be renewed yearly.

### **Installations By Customer (Residential Photovoltaic and Wind Only)**

Residential customers may self-install photovoltaic and wind generators of capacity not to exceed 10 kWac providing they adhere to all applicable codes and standards. The customer installed systems are eligible for an incentive equal to 70% of the standard UFI, as otherwise listed in the incentive table, Attachment D. UNS Electric reserves the right to withdraw this self-install qualification condition at any time in the future, if UNS Electric finds self-installations are not adhering to the applicable codes and standards or are found to be of poor quality workmanship.

## **Energy Reporting**

UNS Electric will report on the productivity of all RECPP distributed renewable energy resource systems within the format of the annual renewable energy Compliance Report to the ACC. For PBI systems, UNS Electric will report on the actual metered production of each system as reported by the customer and confirmed by UNS Electric. For systems receiving a UFI, UNS Electric will report on the total installed capacity and metered production.

## **System Removal**

If receiving a UFI, customer shall not remove the Qualifying System or any components thereof from the premises until December 31<sup>st</sup> of the 20<sup>th</sup> full calendar year following completion of system installation of the renewable energy system, without express agreement of UNS Electric. If receiving a PBI, customer shall not remove the Qualifying System or any components thereof from the premises until the last day of the final month of the final full calendar year of the applicable incentive payment term in the Agreement following completion of system installation of the renewable energy system, without express agreement from UNS Electric. If customer removes the Qualifying System in violation of this provision, customer shall immediately reimburse UNS Electric all incentive amounts paid by UNS Electric to customer or on behalf of customer to an authorized third party.

In addition, if a Qualified System is removed, UNS Electric shall monitor that specific customer site to ensure that an additional incentive is not provided for any new distributed renewable energy resource system on that site until the REC contracted operational life of the original system has been completed.

UNS Electric shall attempt to monitor the number of missing or non-working distributed generation systems and shall summarize its observations in its annual Compliance Report.

## **Qualifying Distributed Renewable Energy Resource Technologies – Technology Criteria**

The following technology criteria are not intended to preclude the participation of any renewable energy technology approved for implementation under the RECPP. These criteria are aimed at detailing those technologies or application segments within a technology which have been reviewed in detail by UNS Electric and were accepted as eligible conforming projects for the RECPP. In addition, the following sections provide detail on those criteria required by participating technologies.

### General Criteria

UNS Electric acknowledges that many regulations and site specific requirements may apply to the installation of any one renewable energy technology. UNS Electric agrees that no requirement imposed by these technology criteria shall be imposed in conflict with any other governmental requirements. Any RECPP based requirement which is in conflict with a site specific governmental requirement shall be detailed in the reservation request. All qualifying systems must adhere to the following requirements in addition to the RECPP program requirements:

- The project must comply with applicable local, state, and federal regulations.
- Products must be installed according to manufacturers' recommendations.

- Installations must meet applicable governmental statutes, codes, ordinances, and accepted engineering and installation practices.
- Systems must be permitted and inspected by the jurisdiction having authority over construction projects in the customer's locale.
- All major system components must be new and must not have been previously placed in service in any other location or for any other application.
- All renewable electricity generation systems must include a dedicated performance meter (provided by UNS Electric) which allows for measurement of system energy production. Certain other non-electric renewable energy production systems, noted below, will require customer supplied metering for PBI payment calculation purposes.
- If the qualifying system is grid-tied, the system must meet Arizona Corporation Commission Interconnection Requirements for Self-Generation Equipment.

#### Referenced standards

Some technology-specific criteria reference third party standards. The requirements of those standards are fully applicable when referenced as part of technology specific criteria. UNS Electric notes that rapid growth in national and international renewable energy programs is resulting in greater need for the development of standardization in such areas as; design, implementation, performance measurement, system integrity, and installation. UNS Electric recognizes that new standards are likely to develop in the near future for technologies included in the RECPP and recommends that the new standards are examined for application in this program definition as they become available. The following standards or standard development bodies are referenced as part of the recommended technology criteria:

- The Active Solar Heating Systems Design Manual developed by the American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) in cooperation with the Solar Energy Industries Association (SEIA) and the ACES Research and Management Foundation (the Design Manual).
- Arizona State Boiler Regulations (see R4-13-406).
- The select technology specific qualification developed by the California Energy Commission (CEC).
- Solar Rating and Certification Corporation (SRCC). The SRCC criteria and ratings can be viewed at [www.solar-rating.org](http://www.solar-rating.org).
- The Underwriters Laboratory (UL).
- IEEE -929 standard for utility interconnection of PV systems.

#### Technology Specific Criteria

The following equipment qualifications listed are mandatory requirements which must be met at the time of project commissioning to receive a RECPP incentive. The installation guidance is intended to provide consumers with information on installation and operation practices which are most likely to support achieving the system's designed output. Installation guidance is mandated in order for a project to receive a RECPP incentive, as it does reflect both industry and UNS Electric concurrence on those practices

which are important for a technology to best achieve the designed output. In the future, additional installation guidance items may be considered for inclusion as part of the equipment qualifications.

### **Biomass/Biogas, Hydro or Geothermal Electric**

#### Equipment Qualifications

- Biomass/Biogas, Hydro or Geothermal system installations involving a regulated boiler or pressure vessel are required to comply with all Arizona state boiler regulations; provide a qualifying boiler inspection identification number; and keep all applicable permits in good standing.
- System must include a dedicated performance meter to allow for monitoring of the amount of electricity produced.
- Pre-operational/or pre-commissioning energy savings and design output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a qualified registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
- The system will have a material and labor warranty of at least five years.
- The system must meet Arizona DEQ environmental standards.

#### Installation Guidance

Because of the individual nature of biomass/biogas hydro or geothermal systems, care should be taken to make sure the system complies with all applicable permitting and regulatory requirements including, but not limited to, air emission standards and air permit regulations.

### **Biomass/Biogas or Geothermal Space Heating, Process Heating or Space Cooling**

#### Equipment Qualifications

- Biomass/Biogas or geothermal system installations involving a regulated boiler or pressure vessel are required to comply with all Arizona state boiler regulations; provide a qualifying boiler inspection identification number; and keep all applicable permits in good standing.
- Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
- System must include a dedicated performance meter to allow for monitoring of the amount of useful cooling produced. As an exception to the REST Rule R14-2-1803.B, energy production will be calculated at one kW-hr per ton of metered cooling for systems with capacity of 100 tons or less and one kW-hr per 1.33 tons for systems with a capacity of greater than 100 tons.

- Energy production for space heating and process heating will be calculated as one kWh of energy per 3,415 Btu of useful heat delivered by the system and used by the building space or process.
- The system will have a material and labor warranty of at least five years.
- The system must meet Arizona DEQ environmental standards.

#### Installation Guidance

Because of the individual nature of biomass/biogas or geothermal systems, care should be taken to make sure the system complies with all applicable permitting and regulatory requirements including, but not limited to air emission standards and air permit regulations.

### **Solar Non-residential Daylighting**

#### Equipment Qualifications

All systems shall include the following components as part of the daylighting system:

- A roof mounted skylight assembly with a dome having a minimum 70% solar transmittance.
- A reflective light well to the interior ceiling or a minimum 12" below roof deck in open bay areas.
- An interior diffusion lens.
- A minimum of one thermal break/dead air space in the system between the skylight dome and the interior diffuser.
- If artificial lighting systems remain a part of the installation, the system shall include automated lighting control(s) which are programmed to keep electric lights off during daylight hours of sufficient solar insolation to provide minimum design illumination levels.
- The system must provide a minimum of 70% of the light output of the artificial lighting system which would otherwise be used for all of the claimed period of energy savings as measured in foot-candles in the workspace 36 inches above the floor.
- Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer or accredited AEE Measurement and Verification professional. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
- The system will have a material and labor warranty of at least five years.

#### Installation Guidance

All systems should be installed such that the skylight dome is substantially unshaded and have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.

### **Small Wind Generator**

A small wind generator is a system with a nameplate capacity rating of one MW or less. The technology criteria described below are intended for small wind generators with a nameplate rating of 100 kW or less.

Larger systems will be required to submit a detailed package describing site selection, energy production modeling, and an engineered system design and installation report.

### Equipment Qualifications

- Eligible small wind systems must be certified and nameplate rated by the CEC<sup>1</sup>. See [www.consumerenergycenter.org/erprebate/equipment.html](http://www.consumerenergycenter.org/erprebate/equipment.html) for a list of certified generators. For grid tied or off-grid wind generators where an inverter is used, the CEC listed nameplate rating of the wind generator will be multiplied by the CEC approved weighted efficiency percentage listed for the inverter in the "List of Eligible Inverters" at [www.consumerenergycenter.org/cgi-bin/eligible\\_inverters.cgi](http://www.consumerenergycenter.org/cgi-bin/eligible_inverters.cgi) to calculate the wind turbine nameplate rating for use in determining the UFI payment.
- Grid connected inverters used as part of the system shall carry a UL listing certifying full compliance with Underwriter's Laboratory ("UL")-1741
- A system must include a dedicated performance meter (provided by UNS Electric) installed to allow for measurement of the amount of electricity produced.
- The performance meter and utility disconnect for grid tied systems will be installed in a location readily accessible by UNS Electric during normal business hours.
- Off-grid systems of capacity less than 10 kWac will not be metered. Compliance reporting production will be based on an annual 20% capacity factor.
- The tower used in the installation must be designed by an Arizona registered engineer and must be suitable for use with the wind generator. Tower installation must be designed and supervised by individuals familiar with local geotechnical conditions.
- To receive a UFI, the wind generator and system must be covered by a manufacturer's warranty of at least ten years. Otherwise the system will qualify for a PBI. In all cases the wind system will have a material and labor warrantee of at least five years.

### Installation Guidance

- Location: a wind turbine hub should be at least 20 feet above any surrounding object and at least 28 feet above the ground within a 250-foot radius. Wind generators should be installed in locations with an elevation at or above the general elevation of the surrounding terrain.
- Lot Size: should be one-half acre at minimum. Municipalities and public facilities such as schools and libraries are exempt from the minimum lot size requirements.
- The proposed system for which application is made should be demonstrated by support information to obtain at least a 15% annual capacity factor. The following are readily available methods for helping to demonstrate the potential for a 15% capacity factor, but other methods may be used. The installation location should have a demonstrated average annual wind speed of at least 10 MPH as measured at a height of no more than 50 feet above the ground. Average annual wind speed can be demonstrated by wind speed records from an airport, weather station, or

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<sup>1</sup> UNS Electric recommends review of the SWCC standards for rating small wind generators once they become available for purposes of supplanting the CEC requirement in this Technology Criterion.

university within 20 miles of the proposed wind generator location, or by a 50 meter wind power density classification of Class 2 "Marginal" or higher on the State of Arizona Average Annual Wind Resource Map dated July 16, 2005, or later as published by Sustainable Energy Solutions of Northern Arizona University. Northern Arizona University provides detailed wind resource maps as well as other resource services. For more information contact Northern Arizona University at <http://wind.nau.edu/maps/>.

## **Photovoltaic Systems**

### Equipment Qualifications

#### *All Systems*

- All systems shall be installed with a horizontal tilt angle between 10 degrees and 60 degrees, and an azimuth angle of +/- 100 degrees of due south. Installation configurations for some systems receiving a UFI will not be eligible for the full RECPP incentive. The reduction will be determined by the UNS Electric developed de-rating chart, Attachment B of this document, and as discussed further in this report under the section titled Conforming Project Incentives.
- A system must include a dedicated performance meter (on grid tied systems, supplied by UNS Electric) to allow for monitoring of the amount of electricity produced.
- Qualifying systems using Building Integrated Photovoltaic (BIPV) modules of total array capacity of 5 kWdc or less shall receive 90% of the UFI incentive value for PV systems listed in Attachment A. Systems using BIPV module of total array capacity of greater than 5 kWDC shall only receive a PBI.
- Photovoltaic modules must be covered by a manufacturer's warranty of at least 20 years.
- Inverters must be covered by a manufacturer's warranty of at least ten years to receive a UFI and at least five years to receive a PBI.

#### *Grid-Connected Systems*

- The minimum PV array size shall be no less than 1,200 Wdc
- All photovoltaic modules must be certified by a nationally recognized testing laboratory as meeting the requirements of UL Standard 1703.
- All other electrical components must be UL listed.
- The inverter must be certified as meeting the requirements of IEEE-1547 - Recommended Practice for Utility Interface of Photovoltaic Systems and it must be UL 1741 certified.
- The utility meter, inverter, and utility disconnect will be installed in a location readily accessible by UNS Electric during normal business hours.
- Systems shall meet the requirements of Attachment A or Attachment C as appropriate.

### *Off-Grid Systems*

- The minimum PV array size shall be no less than 600 Wdc and the maximum PV array size shall not exceed 2,000 Wdc.
- All photovoltaic modules must be certified by a nationally recognized testing laboratory as meeting the requirements of UL 1703.
- Off-grid systems will not be metered. Compliance reporting production will be based on an annual 20% capacity factor using nameplate DC rating for capacity.
- All other electrical components must be UL listed.

### Installation Guidance

The Customer will be directed to the following resources to gain information regarding industry reference documents for system installation and performance forecasting:

The California Energy Commission's Guide to Buying a Photovoltaic Solar Electric System at [http://energy.ca.gov/reports/2003-03-11\\_500-03-014F.PDF](http://energy.ca.gov/reports/2003-03-11_500-03-014F.PDF)

The Arizona Consumers Guide to Buying a Solar Electric System at [www.azsolarcenter.com/design/azguide-1.pdf](http://www.azsolarcenter.com/design/azguide-1.pdf)

### **Solar Space Cooling**

#### Equipment Qualifications

- The minimum cooling capacity of the system will be 120,000 BTU (10 tons) per hour.
- Solar collector panels used will have a Solar Rating and Certification Corporation ("SRCC") OG-100 rating or laboratory documentation showing the panel energy output under controlled and replicable test conditions.
- Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
- System must include a dedicated performance meter to allow for monitoring of the amount of useful cooling produced. As an exception to the REST Rule R14-2-1803.B, energy production will be calculated at one kW-hr per ton of metered cooling for systems with capacity of 100 tons or less and one kW-hr per 1.33 tons for systems with a capacity of greater than 100 tons.
- The system will have a material and labor warranty of at least five years.



### Installation Guidance

- The horizontal tilt angle of the collector panels should be between 20 and 60 degrees and an azimuth angle should be between +/- 45 degrees of south.
- All systems should be installed such that the energy collection system is substantially unshaded and should have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.
- The system installation should comply with the design manual.

### **Non-residential Solar Water Heating and Space Heating**

#### Equipment Qualifications

- Solar collector panels used will have a SRCC OG-100 certification or laboratory documentation showing the panel energy output under controlled and replicable test conditions.
- If annual energy production is expected to exceed 10,000 kWh or equivalent, the system must include a dedicated performance customer supplied meter to allow for monitoring of the amount of useful heat produced. Otherwise, compliance reporting production will be based on the design energy savings submitted at time of application.
- Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
- The solar collector, heat exchangers and storage elements shall have an equipment warranty of at least 10 years to qualify for a UFI and at least five years to qualify for a PBI
- The system will in all cases have a material and full labor warranty of at least five years.

### Installation Guidance

- The horizontal tilt angle of the collector panels should be between 20 and 60 degrees (30 and 60 degrees for space heating applications) and an azimuth angle +/- 45 degrees of south.
- All systems should be installed such that the energy collection system is substantially unshaded and should have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.
- The system installation should comply with the design manual.

## Small Domestic Solar Water Heating and Space Heating

### Equipment Qualifications

- Domestic Solar Water Heating systems will be rated by the SRCC and meet the OG-300 system standard. Systems that include OG-100 collectors, but are not certified under OG-300, will need to be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer detailing annual energy savings. Solar Space Heating systems will utilize OG-100 collectors.
- Domestic Water Heating systems shall be selected and sized according to the geographic location and hot water needs of the specific application. Reservation requests will include a manufacturer's verification disclosing that the system size and collector type proposed is appropriate for the specific application, including certification that collector stagnation temperature shall never exceed 300 degrees Fahrenheit under any possible conditions at the location of the installation. The manufacturer's verification may be presented as a manufacturer's product specification sheet and will be included in the reservation request. Compliance reporting production will be based on the design energy savings submitted at time of application
- Solar Space Heating systems will be sized in conformance with the Solar Space Heating Incentive Calculation Procedure (Attachment E.) Compliance reporting production will be based on the design energy savings submitted at time of application
- Active, open-loop systems are not eligible for RECPP incentives except for active, open-loop systems that have a proven technology or design that limits scaling and internal corrosion of system piping, and includes appropriate automatic methods for freeze protection and prevents stagnations temperatures that exceed 250 degrees F. under all conditions at the location of installation. Details disclosing conformance with this exception shall be submitted as part of the manufacturer's verification documentation.
- Integrated Collector System (ICS) systems shall have a minimum collector piping wall thickness of 0.058 inches. Details disclosing conformance with this requirement shall be submitted as part of the manufacturer's verification documentation. ICS units shall include certification that collector stagnation temperature shall never exceed 250 degrees F. under any possible conditions at the location of the installation.
- The 'high' limit on all Domestic Water Heating controllers shall be set no higher than 160 degrees F.
- Active thermal storage for solar space heating systems shall use water as the storage element.
- Contractors must provide a minimum of a five year equipment warranty as provided by the system manufacturer, including a minimum warranty period of five years for repair/replacement service to the customer.
- Domestic Water Heating systems that are installed as an addition to an existing system or are submitted as a customer designed system or not certified to OG-300 must be specifically reviewed and approved by the utility
- The solar collector, heat exchangers and storage elements shall have an equipment warranty of at least 10 years to qualify for a UFI and at least five years to qualify for a PBI

## Installation Guidance

- The system shall be installed with a horizontal tilt angle between 20 degrees and 60 degrees (40 and 60 degrees for space heating applications), and an azimuth angle of +/- 60 degrees of due south (+/- 20 degrees for space heating applications). It is recommended that collectors be positioned for optimum winter heating conditions at a minimum tilt angle of 45 degrees above horizontal, or as recommended by the manufacturer for the specific collector type and geographic location of installation.
- All systems should be installed such that the energy collection system is substantially unshaded and should have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.
- Heat exchange fluid in glycol systems should be tested, flushed and refilled with new fluid as necessary or at a minimum every five years or sooner per manufacturer's recommendations.
- It is recommended that the anode rod be checked and replaced per manufacturer's recommendations, but no less frequently than every five years.
- It is recommended that the system design include a timer, switch, or other control device on the backup element of the storage tank.
- The collectors and storage tank should be in close proximity to the backup system and house distribution system to avoid excessive pressure or temperature losses.
- It is recommended that in areas where water quality problems are reported to have reduced the expected life of a solar water heater, that a water quality test is performed for each residence to screen for materials that through interaction with the materials of the proposed solar water heating system may reduce the expected operational life of the system components. The customer should consider contacting the manufacturer to determine if warranty or operational life will be affected.
- In areas subject to snow accumulation, sufficient clearance will be provided to allow a 12" snowfall to be shed from a solar collector without shadowing any part of the collector.
- Each system shall have a comprehensive operation and maintenance manual at the customer's site, which includes a spare parts list, data sheets and flow diagrams indicating operating temperatures and pressures, maintenance schedules and description of testing methods and each customer must complete an initial start up and operation training review with the contractor at the time of system start up.
- Ball valves shall be used throughout the system. Gate valves shall not be used.
- Pipes carrying heated fluids shall be insulated for thermal energy conservation as well as personnel protection.

## **Technologies without Technology Specific Criteria and Non-Conforming Projects**

Technology specific criteria have not yet been developed for the following qualifying technologies:

- Fuel Cells
- Non-Residential Pool Heating

For applicants requesting incentives for the above technologies or for applicants requesting installation of a technology with conforming project technology criteria, but where some criteria cannot be met, the applicant will need to submit design and output documentation.

Applicants installing these systems will, at a minimum, need to provide an energy savings and designed output report for the system. The report must include either a testing certification for a substantially similar system prepared by a publicly funded laboratory or an engineering report stamped by a qualified registered professional engineer. The engineering report and/or testing certification shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications. Additional information may be required as part of the RECPP requirements.

## **Distributed Renewable Energy Resource Incentives**

### Incentive Principles

RECPP incentives can be applied to systems designed to serve only the typical load of the customer with whom the incentive agreement has been established. The assessment of that typical load does not preclude the periodic production of electricity in excess of the customer's demand. Under some circumstances it is understood that select customer installations will be designed to serve loads greater than that of the customer. Under those circumstances, the RECPP incentive will be applied only to the fraction of the generation which is used to serve the typical customer load. Other incentives were developed separate and apart from other RECPP program incentives, such as those for demand side management projects. Systems are not eligible to receive RECPP incentives if other utility incentives are applied.

Up-front incentives (UFIs) are those incentives where the customer receives a one-time payment based on the system's designed capacity or based on the first year energy savings provided by the system. In general, this type of incentive is appropriate for smaller, 20 kWac or less, non-residential installations and all residential installations. The second incentive type is a production based incentive (PBI). The PBI allows the customer to collect incentive payments in direct relation to the actual system production. PBIs are most appropriate where the total system costs are large, of 20 kWac capacity or above.

Incentive funds can be applied to a project, which is the sum of all systems installed at a customer site in a single calendar year. A customer site is the sum of facilities and/or buildings associated with a single utility revenue meter.

A customer site can obtain a UFI for multiple projects, under separate reservations, up to 20,000 Wac capacity equivalent at each customer site. Once the sum of incentives for all project(s) exceeds the 20,000 Wac capacity equivalent limit, described below, incentives for additional projects will take the form of a PBI. This condition only applies to non-residential systems. No partial or split payment types are allowed under one project regarding a UFI or PBI.

All residential systems will be offered only a UFI, unless system warranty conditions will not qualify for a UFI in which case a PBI would apply. Residential customers will receive a UFI up to a cap of 20kWac. If a residential system is installed above 20 kWac, UNS Electric will only provide an incentive payment

for the first 20 kWac. Non-residential systems may receive either a UFI or a PBI, depending on the warranty period, technology and the installation size. UFIs were developed for technologies where the average project size results in a total single site renewable capacity equivalent installed less than or equal to 20,000 watts AC. PBIs were developed for technologies where the average project size results in a total single site installed capacity equivalent of more than 20,000 Wac. Both UFIs and PBIs were developed for technologies where projects can range in size. There is no incentive cap for non-residential systems other than annual program funding considerations.

In return for UNS Electric's payment of a UFI, UNS Electric will be given complete and irrevocable ownership of the RECs until December 31<sup>st</sup> of the 20<sup>th</sup> full calendar year after completion of installation of the system. Operational life during that time frame must be supported by system warranty or planned maintenance schedules.

UNS Electric's payment of a PBI will assure UNS Electric complete and irrevocable ownership of the REC for the full duration of the PBI agreement. The agreement duration must fully coincide with the PBI payment schedule and the system must be supported by system warranty or planned maintenance schedules for the term of the agreement.

Projects receiving a UFI can receive no more than 60% of the system cost in the total incentive payout. A PBI can not exceed 60% of the real project costs, defined as the undiscounted total system cost plus acceptable financing charges. Acceptable finance charges are finance charges used for the PBI incentive cap calculation and can not exceed the current prime interest rate plus 5%. Financing charges must be disclosed as part of the commissioning package, if not disclosed before.

It is expected that the UFI and PBI incentive caps as a percentage of system cost will decline in the third year of the program to 55%, and the caps will decline to 50% in the fifth year and beyond.

RECPP incentives in combination with other state and federal incentives make it likely that some renewable energy production systems would be free to the customer, or in the extreme, that the customer would realize a net profit from installing a system.

To prevent this result, UNS Electric requires that customers requesting incentives for these systems be required to contribute a minimum of 15 percent of the System Cost in the case of a UFI and of the Project Cost in the case of a PBI. As such, the incentive for all RECPP projects will be calculated as follows: assume the full application of all available incentives, not including the RECPP incentive, and regardless of the customer's ability to fully realize any particular incentive, add the customer contribution (15%), and finally add the RECPP incentive. If the RECPP incentive can be fully applied given the other incentive cap provisions without exceeding the System Cost in the case of a UFI or Project Cost in the case of a PBI, the customer will receive the full incentive amount. If the RECPP incentive cannot be fully applied without exceeding the System Cost in the case of a UFI or Project Cost in the case of a PBI, the RECPP incentive will be capped such as not to exceed the System Cost in the case of a UFI or the Project Cost in the case of a PBI. The incentive amount will be calculated at the time the application is approved for reservation. If federal or state incentives change during the period of time after the reservation approval, the incentive amount reserved will not be changed as long as the reservation is not cancelled.

### Conforming Project Incentives

Conforming project incentives were developed to help create or expand incipient markets for distributed renewable energy production facilities, taking into account each technology's specific market conditions, and placing a significant portion of the cost on project owners. The incentives reflect specific input from each technology representative(s). Program incentives were generally not developed with specific consideration for other available state or federal incentives. Incentive caps detailed above were relied upon to account for the impact of multiple incentive sources.

In general, PBI incentive levels were developed first by establishing an incentive for a 10-year agreement. The incentives proposed by UNS Electric are detailed in Attachment D. UNS Electric proposes that the incentive matrix in Attachment D be applied for the first five years of the RECPP. In all cases, incentive values listed in Attachment D are maximum values. Applicants are encouraged to submit applications requesting incentive amounts less than the maximums listed. Applications requesting a lower level of incentive payment than the maximum will have an increased chance of acceptance in the allocation ranking process.

UNS Electric proposes that incentive types should transition to all PBI based incentives after 2012 and incentive levels should continue to decline in future program years. In the long term, incentives should be market based. UNS Electric also recommends that the declining incentives and proposed reductions be carefully reviewed prior to implementation.

### Technologies with Special Incentive Considerations

Beyond the requirements of the technology specific criteria and the requirements of the incentive matrix, some technologies require additional project specific adjustment of the available incentives. Those specific requirements are detailed below.

#### **Photovoltaic Systems**

The productivity of photovoltaic systems is sensitive to the specifics of the installation method and location. In particular, these systems are impacted by shading, photovoltaic panel horizontal tilt angle and azimuth, and potentially regional conditions. These factors are particularly important as they relate to systems receiving UFI type incentives both in the amount of incentive received by the customer and in the computation of the capacity reported by UNS Electric.

UNS Electric has established a single incentive adjustment table clearly detailing adjustments for each allowable photovoltaic system configuration. UNS Electric will work to assure that the adjustment table is easily interpreted by consumers and installers. The incentive adjustment chart prepared by UNS Electric is included as Attachment B.

#### **Small Domestic Solar Hot Water and Space Heating Systems**

Accurately predicting appropriate incentive levels in support of system costs associated with small domestic solar hot water and space heating systems present a challenge. RECPP incentives in combination with other state and federal incentives make it likely that some systems would be free to the customer, or in the extreme, that the customer would realize a net profit from installing a system.

To prevent this result, UNS Electric proposes that customers requesting incentives for these systems be required to contribute a minimum of 15 percent of the system cost. As such, the incentive for small domestic solar hot water and space heating systems will be calculated as follows: assume the full application of all available incentives, not including the RECPP incentive, and regardless of the customer's ability to fully realize any particular incentive, add the customer contribution (15%), and finally add the RECPP incentive. If the RECPP incentive can be fully applied without exceeding the System Cost, the customer will receive the full incentive amount. If the RECPP incentive cannot be fully applied without exceeding the System Cost, the RECPP incentive will be capped such as not to exceed the System Cost.

Example:

$$\text{RECPP Incentive} \leq (\text{System Cost}) - (\text{Total of all Incentives})$$

Where:

$$\text{Total of all Incentives} = \text{Federal Incentives} + \text{State Incentives} + (15\% \text{ Customer Contribution})$$

For purpose of UFI calculation, System Cost for a solar space heating system will not include the cost of any passive thermal storage or the cost of the building heating system itself. It will include the cost of new materials and installation of active thermal storage, expansion tanks, controls, tempering valves, piping, vents, drains, safety valves and all freeze protection.

### **Small Solar Space Heating System**

There are several additional challenges associated with Solar Space Heating Systems. Variability in design for these systems generally suggested a high level of expertise was required to appropriately size and design the systems; yet the overall system cost seemed to require a standardized approach. In order to address this challenge, UNS Electric has adopted a standardized calculation method to support system sizing and incentive payment. The display page of the spreadsheet calculation is presented in Attachment E.

The solar space heating incentive calculation does not suggest or imply that a full energy audit is required to qualify for the solar space heating incentive. The intent is that industry professionals can utilize the calculation tool to aid in facilitating sound system design.

The effective use of the solar space heating incentive calculation is contingent on a Building Design Review. The Building Design Review calculations, inputs and outputs will be determined and specified as part of the reservation request. It is noted that stakeholder acceptance of the proposed calculation tool is conditioned on the future development of standardized design tools, potentially including input tables and charts.

UNS Electric believes that the proposed approach reflects sound design principles and uses inputs which should be available to professionals in this industry segment. UNS Electric does, however, recognize that the approach used in the standardized calculation is not currently universally applied. UNS Electric proposes that continuing efforts be made to develop standard input charts and tables to increase the

efficiency of the method's application. In addition, it is the expectation of UNS Electric that the standard calculation can, in most instances, be implemented by practitioners in the solar space heating industry. UNS Electric supports industry collaborative efforts to increase technical knowledge development in this specific area.

### **RECPP Incentive Allocation**

UNS Electric identified two primary program level allocations in conjunction with the RECPP. The first allocation is that associated with RECPP conforming projects. The second is that associated with RECPP non-conforming Projects.

#### Conforming Project Incentive Allocation

Beyond the allocation made by UNS Electric for purposes of funding conforming projects, UNS Electric also recommends an allocation framework within the conforming project allocation. UNS Electric designed the allocation framework with several key considerations in mind. The factors considered in developing project incentive allocations were as follows:

- Administrative ease
- Economic efficiency
- Consumer clarity and ease of understanding
- Establishment of a high degree of market certainty
- Encouragement of cost reductions in renewable energy technologies
- Flexibility sufficient to allow timely adaptations to changing market conditions
- Capability for making funds available in a timely manner, and
- Avoidance of excessive incentives

These considerations resulted in two different allocation frameworks, one for residential projects and one for non-residential projects. The allocation frameworks are described below.

#### Conforming Projects – Residential Incentive Allocation – 85% of Distributed Generation funds in 2008.

Funds for conforming residential projects will be divided into four quarters (Jan-Mar, Apr-Jun, Jul-Sep, and Oct-Dec). Funds within each quarter will be made available weekly for reservations on a first-come, first-served basis. However, applications received during a given week that request incentive funding levels below the maximum incentive values will receive priority for the allocation of funds available that week based on the lowest expected life cycle credit purchase cost as provided in the application and verified by UNS Electric. Reservation requests can be made throughout each quarter and will be reviewed and approved by the utility weekly as long as the quarterly funding has not been exhausted, assuming all other program requirements have been met.

Funds unused in one quarter will be equally divided among the remaining quarters in that year. Funds allocated to residential projects will not roll forward from one year to the next. If funds in one quarter are



fully exhausted, funds for the following quarter will be made available at the start of the following quarter.

Reservations which are rejected as a result of insufficient funds will be offered the opportunity to retain their original reservation date for one additional quarter without the need to resubmit application documentation. If the incentive level has changed from the date of the original reservation to the date when the reservation is approved, the new incentive level shall be applied.

Conforming Projects – Non-residential Incentive Allocation – 15% of Distributed Generation Funds in 2008.

The non-residential incentive allocation framework allows market forces to play a major deciding role in the selection of projects when the volume of proposed projects exceeds the budget for non-residential projects. When the volume of proposed projects is relatively small so that the non-residential program is not fully subscribed, all conforming projects would be selected. In addition, a yearly review will be made to observe and review trends in requested and approved incentive levels. UNS Electric believes this element is important for the on-going management and potential adjustment of incentive levels as needed to respond to market conditions.

Non-residential funds will be equally divided into four quarters (Jan-Mar, Apr-Jun, Jul-Sep, and Oct-Dec). Funds within each period will be made available to projects based on a ranking generated by lowest expected life cycle credit purchase cost as provided in the application and verified by UNS Electric. In the event of a tie in the ranking, when the program would be fully subscribed if both projects were given reservation status, funds will be awarded based on the date of receipt of the completed reservation request.

In each three-month period, reservation requests will be accepted, but they will be reviewed by the utility only after the conclusion of the three month period. Once reservation requests are fully ranked in each reservation period, notification of reservation approvals and rejections will be made in conformance with the rankings and available funding.

Funds unused in one period will be equally divided among the remaining periods in that year. Funds allocated to non-residential projects will not roll forward from one year to the next. Reservations which are rejected as a result of insufficient program funds may elect to carry forward into the next period and retain the original reservation date. The election must be made at the time of the original application.

Within each period, projects submitted to the utility for reservation will be ranked based on a calculated index value for purposes of allocating non-residential funds as proposed in the application and verified by UNS Electric. Lowest lifecycle cost projects will be funded first. Indexing of the non-residential projects will be performed based on the verified incentive values and terms in the application for that project. Projects with higher incentive payments result in a higher expected life cycle credit purchase cost and projects that produce more kWh result in a lower expected life cycle credit purchase cost.

## **Conforming Projects Fund Contributions Between Residential and Non Residential**

Available funding will be split between residential and non-residential project classes. Initially 15% is being allocated to non residential system incentives and 85% is being allocated to residential system incentives. This split will be reapplied each quarter if all funds are not reserved.

### **Non-Conforming Projects – Allocation: 0% of Distributed Generation Funds in 2008.**

Non-conforming projects include, but are not limited to, projects with staged completion dates, multi-customer or multi-system projects, projects involving more than one technology where an interrelated incentive was not developed, projects requiring new or unique agreement terms, or projects requiring timelines differing from those offered to conforming projects. Non-conforming projects also include technologies for which a conforming incentive or technical qualifications were not developed at the time of this plan.

As detailed in the RECPP incentive allocation section of this plan, UNS Electric will disclose the allocation of funds for non-conforming projects in its implementation plan for the next year. UNS Electric will generally, but not always, include a minimum allocation to allow for the potential development of projects with technologies not included on the conforming project incentive matrix.

UNS Electric will apply a minimum of 50% and a maximum of 75% of the non-reserved, non-conforming project allocation to conforming project funding at the end of each calendar quarter. Unreserved non-conforming project allocations will not carry forward from one year to the next.

Incentives used for non-conforming projects must achieve similar economic efficiency as those incentives used in the conforming project category. Incentives applied for non-conforming projects must meet the lower of: 1) the maximum allowable incentive for the proposed technology as described in Attachment D, or 2) the average incentive value of projects accepted by UNS Electric for incentive disbursement for the proposed technology in the previous year.

Some qualifying technologies will not meet either of the previously described economic efficiency measures. Those applicants can negotiate the requested system or project incentive with UNS Electric. In no instance can the incentive exceed the highest calculated appropriate incentive payment value for projects approved by UNS Electric in the previous year.

Under some circumstances a non-conforming project may not identify the customer at project initiation. Regardless of the project design, implementation, or timeline, a customer must be identified at the time of system commissioning. Non-conforming funds will be disbursed upon filing by the customer and acceptance of project commissioning documentation by UNS Electric. For purposes of financing non-conforming projects, funds can be assigned to third parties.

Non-conforming systems must report system capacity (for up-front incentives) or production (for performance-based incentives) in general conformance with those same technologies as described in the conforming project requirements and be covered by similar warranties. For those technologies not described in the conforming project criteria, the reservation documentation must include details related to

warranty, system capacity and anticipated annual production. Metering equipment must be made available to UNS Electric during normal business hours for inspection and reporting purposes.

Initially, no funding would be allocated to the Non-Conforming Project class. However, if Non-Conforming Project applications are received, unused funds from the Conforming Project Classes may be allocated to the Non-Conforming Project class. Alternatively, if sufficient interest in developing Non-Conforming Projects is demonstrated, they could be accepted into the Conforming Project class after development and acceptance of technical standards and appropriate incentive values; or UNS Electric could request a special project fund allocation for a specific Non-Conforming Project in its annual REST Tariff Adjustor Mechanism and Implementation Plan filing.

Application Process  
**ATTACHMENT A**

**System Qualifications**

All solar electric generating Customer Systems must meet the following system and installation requirements to qualify for Tucson Electric Power Company's ("UNS Electric" or the "Company") GreenWatts™ SunShare Hardware Buydown Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Hardware Buydown Agreement.

1. A Residential Customer System must have a total solar array nameplate rating of at least 1,200 watts DC and no more than 30,000 watts DC. Any Non-Residential Customer System must have a total solar array nameplate rating of more than 1,200 watts DC.
2. The Customer System components must be certified as meeting the requirements of IEEE-929 - Recommended Practice for Utility Interface of Photovoltaic Systems.
3. The Customer System components must be certified as meeting the requirements of UL-1741 - Power Conditioning Units for use in Residential Photovoltaic Power and be covered by a non-prorated manufacturer's warranty of at least two years.
4. Photovoltaic components must be certified as meeting the requirements of UL-1703 - Standard for Flat Plate Photovoltaic Modules and Panels Systems and be covered by a non-prorated manufacturer's warranty of at least 20 years.
5. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code, including Article 690 and all grounding, conductor, raceway, over-current protection, disconnect and labeling requirements.
6. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code in effect in the jurisdiction where the installation is being completed (NEC), including, without limitation, Sections 200-6, 210-6, 230-70, 240-3, 250-26, 250-50, 250-122, all of Article 690 pertaining to Solar Photovoltaic Systems, thereof, all as amended and superseded.
7. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
8. The Customer System installation must meet the UNS Electric Service Requirements as follows:  
  
"An AC disconnect means shall be provided in an area accessible at all times to the Company on all ungrounded AC conductors and shall consist of a lockable gang operated disconnect clearly

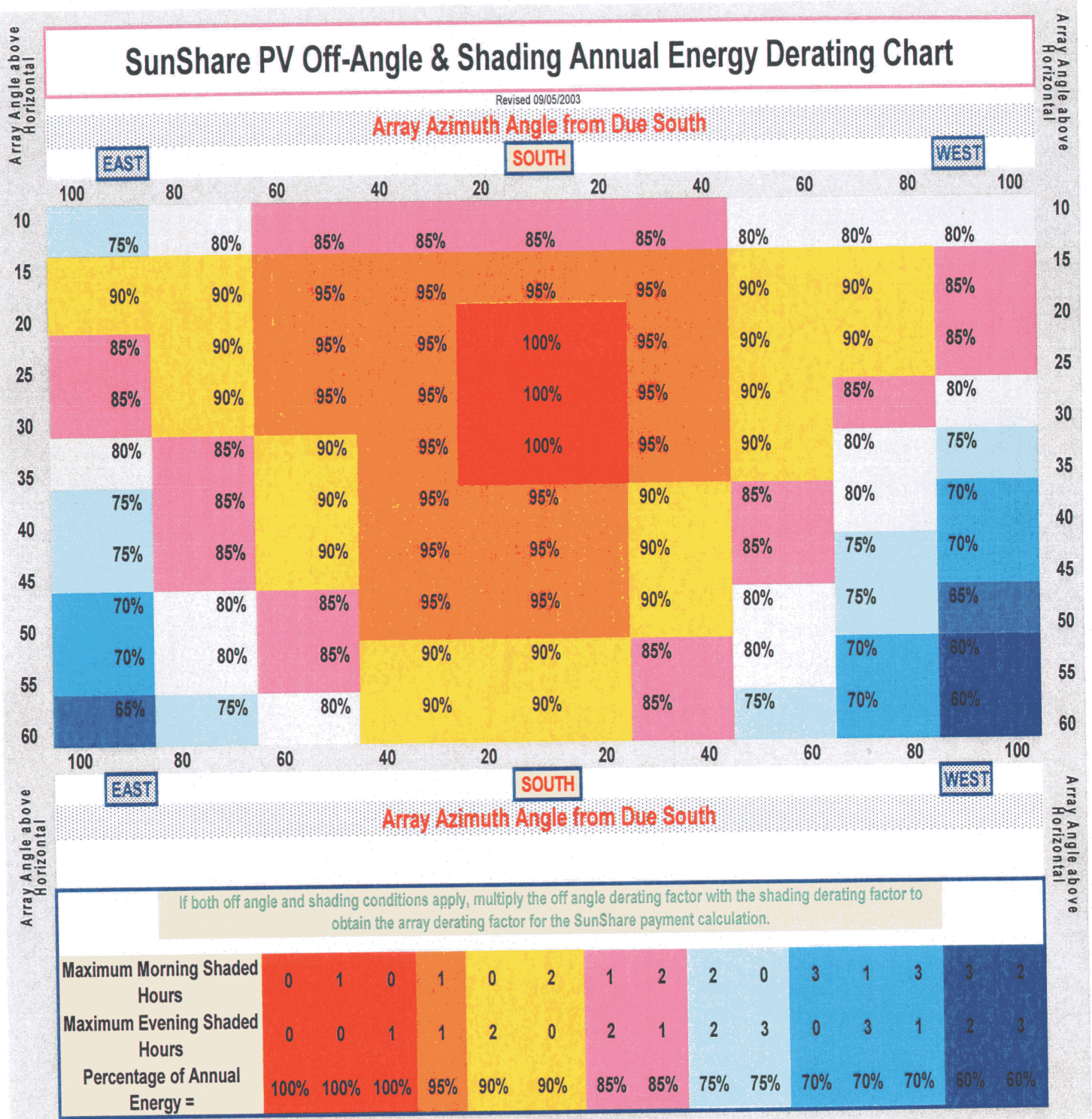
indicating open or closed. The switch shall be visually inspected to determine that it is open. The switch shall be clearly labeled "DG SERVICE DISCONNECT."

9. The Customer System photovoltaic panels and modules must face within +/- 100 degrees of real south, and be completely unshaded from three hours after sunrise to three hours before sunset. System arrays which are facing at an azimuth angle of more than 20 degrees from true south or shaded for more than one hour per day will be subject to a reduced amount of buydown payment per Attachment B.
10. The Customer System photovoltaic panels and modules must be fitted at an angle of 10 degrees to 60 degrees from horizontal. System arrays which are fitted with an elevation angle of less than 20 degrees or more than 35 degrees above horizontal will be subject to a reduced amount of buydown payment per Attachment B.
11. For Residential Customer Systems, Company will provide a meter and meter socket that will be installed in a readily accessible outdoor location by the Customer between the DC to AC converter and the connection to the over-current device in the Customer's electric service panel. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the DC to AC converter and the connection to the over-current device in the Customer's electric service panel.
12. Storage Batteries are not allowed as part of the Customer System unless the inverter is a separate component and UNS Electric can locate the Solar Meter at the inverter's output. If configured otherwise, battery losses will adversely reflect in the annual AC metered energy output. Customer's solar energy generation and energy storage system must meet the requirements of 2 and 3 of this Attachment A.
13. Installation must have been made after January 1, 1997.
14. The Customer must be connected to the Company's electric grid, except for approved off-grid systems in conformance with the RECPP.
15. The DC to AC inverter used must provide maximum power point tracking for the full voltage and current range expected from the photovoltaic panels used and the temperature and solar insolation conditions expected in Mohave County or Santa Cruz County, Arizona.
16. The DC to AC inverter must be capable of adjusting to "sun splash" from all possible combinations of cloud fringe effects without interruption of electric production.
17. All Customer System installations must be completed in a professional, workmanlike and safe manner.
18. Total voltage drop on the DC and AC wiring from the furthest PV module to the AC meter will not exceed 2%.

19. PV panels and DC to AC inverter will be installed with sufficient clearance to allow for proper ventilation and cooling. At a minimum, manufacturer clearance recommendations will be observed. In no case will PV modules be mounted less than 4 inches above any surface and an additional inch of clearance for each foot of continuous array surface beyond four feet in the direction parallel to the mounting support surface.



**ATTACHMENT B**  
**SunShare PV Off-Angle & Shading Annual Energy Derating Chart**



**ATTACHMENT C**  
**Supplemental Non-Residential System Qualifications**  
**(Applicable Only for Customer Systems of Capacity Larger than 20,000 watts AC)**

1. All solar electric generating Non-Residential Customer Systems must meet the following additional system and installation requirements to qualify for UniSource Electric's ("UNS Electric" or the "Company") GreenWatts™ SunShare Hardware Buydown Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Hardware Buydown Agreement.
2. The Non-Residential Customer System shall be operating, substantially complete and have produced an AC output at least 70% of the total array nameplate DC rating at PTC as described below.
3. Operation, Maintenance and Repair. The Customer shall be solely responsible for the operation, maintenance and repair of the Non-Residential Customer System and any and all costs and expenses associated therewith. Company will notify Customer of all Non-Residential Customer System repairs the Company determines are reasonably necessary to support proper continued electrical production of the Non-Residential Customer System. The Customer will notify the Company within five (5) business days of its receipt of any such Company repair notice if the repair requires the installation of a new inverter and/or PV module. The Customer shall complete any such repair that affects the Non-Residential Customer System performance and does not require the purchase of a new inverter or PV module(s) within five (5) business days of the Company's notice of the need for such repair. For any such repair that does require the purchase and installation of a new inverter and/or PV module, the Customer shall promptly commence and diligently pursue such repair to completion, provided, in no event shall such repair take more than thirty (30) days to complete. At all times while Company is receiving the environmental credits from the Non-Residential Customer System, Customer shall clean all PV modules in the Non-Residential Customer System as necessary to keep them free from foreign material that would visibly obscure the modules, including any dirt and/or oils.
4. Non-Residential Customer System Security. At all times during and after installation of the Non-Residential Customer System, the Customer shall use commercially reasonable efforts to provide adequate security to prevent damage or vandalism to the Non-Residential Customer System.
5. Company shall provide Customer with a revenue grade AC meter to be installed between the Non-Residential Customer System and the grid interconnection. This meter will not be used for billing, but shall be used for any official Non-Residential Customer System production output data. Company will retain ownership of the meter and be responsible for its repair if needed.
6. The utility interactive solar generation Non-Residential Customer System shall deliver an AC output in AC watts at least equal to 70% of the total array nameplate rating in DC watts as measured at performance test conditions (PTC) of 1000 watts/m<sup>2</sup> irradiance, 68 degrees F. ambient temperature and a maximum of a 2.4 mph wind speed. The Customer will verify performance of



the system with a 30 day test using a temporary data monitor and acquisition system or make a single point measurement to determine the output of the system.

7. The Customer shall verify and demonstrate to Company the proper calibration and operation, through a temporary data monitor and acquisition system, of the solar insolation sensor, the ambient temperature sensor, the wind speed sensor and the AC power meter within +/- 2% of Company independent sensor data. If performance test data is not available at PTC, the indicated AC power output of the Non-Residential Customer System will be corrected to PTC by the following formula:

$$\text{Power(PTC)} = ((\text{Power(Meter)} * (1000 / \text{SolarSensor(W/M}^2))) * (1 + (((\text{AmbientTempSensor(DegF)}) - 68) * 0.0026)))$$

(On the condition that data used in the formula is taken on a cloudless day at a solar insolation of at least 950 watts per square meter and wind speed is less than 2.4 mph)

8. Company shall have the right to challenge the accurate calibration of the sensors and temporary data monitor and acquisition system with proper documentation demonstrating the reasons for the challenge. The Customer shall resolve the challenged sensor or temporary data monitor and acquisition system calibration to the satisfaction of Company prior to the data being used in the performance test being recorded.
9. Customer shall provide Company with no less than ten (10) days prior notice of any planned Customer tests to the Non-Residential Customer System. Company shall have the right to be present at any and all tests of the Non-Residential Customer System. The Customer shall provide Company notice as soon as the Non-Residential Customer System has been installed and has passed all Customer tests.
10. Customer shall provide Company with all documentation reasonably requested by Company to demonstrate to the Commission that any environmental credits transferred under the Agreement were derived from an eligible technology, that the kWh generated are accurately reported and that the environmental credits have not expired or been used by any other entity for any purpose.
11. If certified proof can not be provided of complete galvanic isolation of any and all DC from the AC output of the inverter(s) used in the Non-Residential Customer System through IEEE-1547 certification of the inverter, the Non-Residential Customer System shall include an isolation transformer installed between the inverter(s) and the grid interconnection. The transformer will be rated at full load continuous operation at 50 degrees C. at 125% of nameplate DC array rating and have an efficiency rating at nameplate DC array rating power of at least 98% as tested. The transformer will have at least one tap each of 2.5% and 5% both above and below the nominal voltage tap.

# ATTACHMENT D

## RECPP – CONFORMING PROJECT INCENTIVE MATRIX

2008 and 2009 Program Year

Technology/Application	UP FRONT INCENTIVE <sup>1</sup> 20-Year REC Agreement	10-Year REC Agreement <sup>2</sup> 10-Year Payment (\$/kWH)	15-Year REC Agreement <sup>2</sup> 15-Year Payment (\$/kWH)	20-Year REC Agreement <sup>2</sup> 20-Year Payment (\$/kWH)
BIOMASS/BIOGAS (Electric)	NA	0.060	0.056	0.054
BIOMASS/BIOGAS – CHP (Electric) <sup>3</sup>	NA	0.035	0.032	0.031
BIOMASS/BIOGAS – CHP (Thermal) <sup>3</sup>		0.018	0.017	0.016
BIOMASS/BIOGAS (thermal)	NA	0.015	0.014	0.013
BIOMASS/BIOGAS (cooling)	NA	0.032	0.030	0.029
DAYLIGHTING (Non-Residential)	\$0.20/kWH <sup>7</sup> See this note for clarification	NA	NA	NA
GEOHERMAL – (electric)	NA	0.024	0.022	0.022
GEOHERMAL – (thermal)	1.00/Watt	0.048	0.045	0.043
GEOHERMAL – (cooling)	NA	0.032	0.030	0.029
SMALL HYDRO	NA	0.060	0.056	0.054
SMALL WIND (grid-tied) <sup>4</sup>	\$2.50/Watt AC	0.145	0.135	0.130
SMALL WIND (off-grid) <sup>4</sup>	\$2.00/Watt AC	0.116	0.108	0.104
SOLAR ELECTRIC:				
RESIDENTIAL (GRID-TIED)	\$3.00/Watt DC <sup>8</sup>	0.202	0.187	0.180
Non-Residential (Grid-Tied) 20 kW or less	\$2.50/Watt DC <sup>8</sup>	0.202	0.187	0.180
NON-RESIDENTIAL (GRID-TIED) More than 20 kW	NA	0.202	0.187	0.180
RESIDENTIAL (OFF-GRID)	\$2.00/Watt DC <sup>8</sup>	NA	NA	NA
NON-RESIDENTIAL (OFF-GRID)	NA	0.121	0.112	0.108
SOLAR SPACE COOLING <sup>5</sup>	NA	0.129	0.120	0.115
SOLAR WATER HEATING/SPACE HEATING <sup>5</sup> (Non-Residential)	NA	0.057	0.052	0.051
RESIDENTIAL SOLAR WATER/SPACE HEATING <sup>6</sup>	\$750.00 plus \$0.25/kWH to a maximum of \$1,750.00 <sup>9, 10</sup>	0.057	0.052	0.051
NON-RESIDENTIAL POOL HEATING	NA	0.012	0.011	0.011

## RECPP – CONFORMING PROJECT INCENTIVE MATRIX

2010 and 2011 Program Year

Technology/Application	UP FRONT INCENTIVE <sup>1</sup> 20-Year REC Agreement	10-Year REC Agreement <sup>2</sup> 10-Year Payment (\$/kWh)	15-Year REC Agreement <sup>2</sup> 15-Year Payment (\$/kWh)	20-Year REC Agreement <sup>2</sup> 20-Year Payment (\$/kWh)
BIOMASS/BIOGAS (Electric)	NA	0.054	0.050	0.048
BIOMASS/BIOGAS – CHP (Electric) <sup>3</sup>	NA	0.032	0.029	0.028
BIOMASS/BIOGAS – CHP (Thermal) <sup>3</sup>		0.016	0.015	0.014
BIOMASS/BIOGAS (thermal)	NA	0.014	0.013	0.012
BIOMASS/BIOGAS (cooling)	NA	0.029	0.027	0.026
DAYLIGHTING (Non-Residential)	\$0.18/kWh <sup>7</sup> See this note for clarification	NA	NA	NA
GEOTHERMAL – (electric)	NA	0.022	0.020	0.019
GEOTHERMAL – (thermal)	0.90/Watt	0.044	0.040	0.039
GEOTHERMAL – (cooling)	NA	0.029	0.027	0.026
SMALL HYDRO	NA	0.054	0.050	0.048
SMALL WIND (grid-tied) <sup>4</sup>	\$2.25/Watt AC	0.131	0.121	0.117
SMALL WIND (off-grid) <sup>4</sup>	\$1.80/Watt AC	0.105	0.097	0.094
SOLAR ELECTRIC:				
RESIDENTIAL (GRID-TIED)	\$3.00/Watt DC <sup>8</sup>	0.182	0.168	0.162
Non-Residential (Grid-Tied) 20 kW or less	\$2.25/Watt DC <sup>8</sup>	0.182	0.168	0.162
NON-RESIDENTIAL (GRID-TIED) More than 20 kW	NA	0.182	0.168	0.162
RESIDENTIAL (OFF-GRID)	\$1.80/Watt DC <sup>8</sup>	NA	NA	NA
NON-RESIDENTIAL (OFF-GRID)	NA	0.109	0.101	0.097
SOLAR SPACE COOLING <sup>5</sup>	NA	0.116	0.108	0.104
SOLAR WATER HEATING/SPACE HEATING <sup>5</sup> (Non-Residential)	NA	0.051	0.047	0.045
RESIDENTIAL SOLAR WATER/SPACE HEATING <sup>6</sup>	\$750.00 plus \$0.25/kWh to a maximum of \$1,750.00 <sup>9, 10</sup>	0.051	0.047	0.045
NON-RESIDENTIAL POOL HEATING	NA	0.011	0.010	0.010



## RECPP – CONFORMING PROJECT INCENTIVE MATRIX

2012 Program Year

Technology/Application	UP FRONT INCENTIVE <sup>1</sup> 20-Year REC Agreement	10-Year REC Agreement <sup>2</sup> 10-Year Payment (\$/kWh)	15-Year REC Agreement <sup>2</sup> 15-Year Payment (\$/kWh)	20-Year REC Agreement <sup>2</sup> 20-Year Payment (\$/kWh)
BIOMASS/BIOGAS (Electric)	NA	0.046	0.043	0.041
BIOMASS/BIOGAS – CHP (Electric) <sup>3</sup>	NA	0.027	0.025	0.024
BIOMASS/BIOGAS – CHP (Thermal) <sup>3</sup>		0.014	0.013	0.012
BIOMASS/BIOGAS (thermal)	NA	0.011	0.011	0.010
BIOMASS/BIOGAS (cooling)	NA	0.025	0.023	0.022
DAYLIGHTING (Non-Residential)	\$0.15/kWh <sup>7</sup> See this note for clarification	NA	NA	NA
GEOTHERMAL – (electric)	NA	0.019	0.017	0.017
GEOTHERMAL – (thermal)	0.77/Watt	0.037	0.034	0.033
GEOTHERMAL – (cooling)	NA	0.025	0.023	0.022
SMALL HYDRO	NA	0.046	0.043	0.041
SMALL WIND (grid-tied) <sup>4</sup>	\$1.91/Watt AC	0.111	0.103	0.099
SMALL WIND (off-grid) <sup>4</sup>	\$1.53/Watt AC	0.089	0.082	0.080
SOLAR ELECTRIC:				
RESIDENTIAL (GRID-TIED)	\$3.00/Watt DC <sup>8</sup>	0.154	0.143	0.138
Non-Residential (Grid-Tied) 20 kW or less	\$1.91/Watt DC <sup>8</sup>	0.154	0.143	0.138
NON-RESIDENTIAL (GRID-TIED) More than 20 kW	NA	0.154	0.143	0.138
RESIDENTIAL (OFF-GRID)	\$1.53/Watt DC <sup>8</sup>	NA	NA	NA
NON-RESIDENTIAL (OFF-GRID)	NA	0.093	0.086	0.083
SOLAR SPACE COOLING <sup>5</sup>	NA	0.099	0.092	0.088
SOLAR WATER HEATING/SPACE HEATING <sup>5</sup> (Non-Residential)	NA	0.043	0.040	0.039
RESIDENTIAL SOLAR WATER/SPACE HEATING <sup>6</sup>	\$750.00 plus \$0.25/kWh to a maximum of \$1,750.00 <sup>9, 10</sup>	0.043	0.040	0.039
NON-RESIDENTIAL POOL HEATING	NA	0.009	0.009	0.008

### Notes:

- 1) Residential projects are eligible for an up front incentive (UFI). UFI payments can not exceed 60% of the cost of renewable energy equipment.
- 2) Non-residential under 20 kW is preferably UFI but can be a PBI. Non-residential 20 kW and greater is PBI only. The total of payments under a production based incentive can not exceed 60% of the project costs for any project.
- 3) The CHP incentives may be used in combination for the appropriate components of one system.
- 4) This PBI applies to a maximum system size of 100 kW. Larger wind systems may apply for incentives as NCP.
- 5) The solar space heating and cooling incentives may be used in combination for the appropriate components of one system.
- 6) This category includes both traditional water heating and those systems combined with residential solar water heating used for space heating. Space heating applications require a report detailing energy saving for the complete system.
- 7) Rate applies to measured first five years of energy savings only. Payments are made over a five year period.
- 8) Some installations will require an adjustment of the incentive as detailed in the PV Incentive Adjustment Chart.
- 9) Energy savings rating is based on the SRCC OG-300 published rating or the UNS Electric-RECPP Space Heating Calculator. The customer contribution must be a minimum of 15% of the project cost after accounting for and applying all available Federal and State incentives.
- 10) Rate applies to forecast/measured first year energy savings only.  
NA – Not Available

# ATTACHMENT E

## Solar Space Heating UFI Incentive Calculation Procedure.

In Advance, please perform the Design Review and Utility Bill Review (if Applicable) for numbers to enter in Steps #1, #2 and #5.

**Elevation Zone Table:**

Min Elevation	Max Elevation	Heating Season Days	Daily Panel Heat Output
-1000	1000	105	0
1001	3000	140	0
3001	5000	175	0
5001	7000	210	0
7001	9000	245	0
9001	11000	280	0

**Collector Thermal Performance Rating**

Data From OG-100 Sheet

Category:	Delta T	Clear Day
A	-9 Deg. F.	0
B	+9 Deg. F.	0
C	+36 Deg. F.	0
D	+90 Deg. F.	0
E	+144 Deg. F.	0

Enter Solar Panel Make and Model Number Selected for Project:

<b>Step #1:</b>	Enter the result of the Design Review of the Design Annual Building Loss =	0	BTU/Year
<b>Step #2:</b>	Enter the result of the Utility Bill Review of the Actual Annual Building Loss: (If not Electric, Natural Gas or Propane Heat, enter 0) =	0	BTU/Year
<b>Step #3:</b>	Calculate the Lesser of the Result in Step #1 & Step #2 = This is the Annual Building Heat Requirement.	0	BTU/Year
<b>Step #4:</b>	Enter Elevation of the Solar Space Heated Building:	0	Feet AMSL
<b>Step #4 cont:</b>	Number of Heating Days per Heating Season from Elevation Zone Table:	105	Days per Year
<b>Step #4 cont:</b>	Calculate Average Daily Building Heat Requirement =	0	BTU/Day
<b>Step #5:</b>	Enter Passive Heat Storage Specific Heat Capacity from Building Design Review:	0	BTU/Deg. F.
<b>Step #5 cont:</b>	Enter Maximum Daily Room Temperature Variation Allowed by Building Occupants: (Max of 10 Degrees F.)	0	Degrees F.
<b>Step #5 cont:</b>	Calculate Maximum Passive Heat Storage Capacity =	0	BTU
<b>Step #5 cont:</b>	Enter Total Active Heat Storage Heat Capacity from Building Design Review:	0	BTU
<b>Step #5 cont:</b>	Calculate Maximum Total Heat Storage Capacity =	0	BTU
<b>Step #6:</b>	Calculate the Lesser of the Average Daily Building Heat Requirement in Step #4 and the Maximum Total Storage Capacity in Step #5. This is the Maximum Useful Daily Solar Heat Input.	0	BTU/Day
<b>Step #7:</b>	Size the Solar Panels based on a total daily solar heat input no greater than the Maximum Useful Daily Solar Heat Input. Enter the single panel SRCC OG-100 Collector Thermal Performance Rating data in the Table Above.	0	BTU/Day per Panel
<b>Step #7cont:</b>	Enter the Total number of solar panels to be installed:	0	# of Panels
<b>Step #7cont:</b>	Calculate the Average Expected Daily Solar Heat Input:	0	BTU/Day
<b>Step #8:</b>	Calculate the Expected Annual Useful Solar KWH Heat Input using the Number of Heating Days times the Average Expected Daily Solar Heat Input / 3415 BTU/KWH:	0	KWH/Year
<b>Step #9:</b>	Enter the UFI per first year KWH UCPP Incentive Rate:	\$0.75	\$/KWH
<b>Step #9 cont:</b>	Calculate the Total Maximum UFI Payment Subject to Possible Limitation by the 50% of Initial Cost Cap & 15% Minimum Customer Contribution:	\$0.00	\$
<b>Step #10:</b>	Enter the Total Solar Space Heating System Initial Cost: This should not include costs for Passive Heat Storage or Building Heating System.	\$0.00	\$
<b>Step #10 cont:</b>	Calculate the Total Expected Federal and Arizona Incentives for this Project:	\$0.00	\$
<b>Step #10 cont:</b>	Calculate the 15% minimum of the Total Solar Space Heating System Initial Cost to be paid by Customer	\$0.00	\$
<b>Step #10 cont:</b>	Calculate the Total Actual UFI Payment:	\$0.00	\$



# Renewable Energy Standard per 11/2006 Approved REST Rule. Full Compliance Opportunity Plan

UNSE-500

UNSE & REST Program Factors

Renewable Resource Energy and Power Conversion

Annual Credit Balances MWh

Assumption

Residential Solar Electric Up Front Subsidy Payment UCPP Plan

Distributed Solar Hot Water & Wind Up Front Subsidy Payment UCPP Plan

Assumption

Generation Solar Feed In Tariff Plan - non residential solar all years. UCPP

Item	2008	2009	2010	2011	2012
RES Annual Renewable Energy Percentage	1.75%	2.00%	2.50%	3.00%	3.50%
Energy Sales - MWh Growth @ 2.72%/yr	1,762,733	1,826,544	1,881,244	1,945,323	2,015,532
Expected DSM Program Annual Energy Reductions	3,815	7,810	11,948	16,428	20,878
Expected DG Program Annual Energy Reductions	0	3,078	5,447	9,319	14,397
Net Retail Energy Sales in MWh per Year	1,758,918	1,815,656	1,863,849	1,919,576	1,980,257
Renewable Energy - MWh	30,781	36,313	46,596	57,587	69,309
Minimum Distributed Energy %	10.00%	15.00%	20.00%	25.00%	30.00%
Minimum Distributed Energy MWh	3,078	5,447	9,319	14,397	20,793
Minimum Residential Distributed Energy %	5.00%	7.50%	10.00%	12.50%	15.00%
Minimum Residential Distributed Energy MWh	1,539	2,723	4,660	7,198	10,396
Maximum Commercial Distributed Energy %	5.00%	7.50%	10.00%	12.50%	15.00%
Maximum Commercial Distributed Energy MWh	1,539	2,723	4,660	7,198	10,396
Residential Distributed Generation - MWp Total New 60% Solar PV	0.444	0.970	1.831	2.959	4.381
Residential Distributed Energy - MWp Total New 40% Solar Hot Water/Space Heating & Wind	0.616	1.089	1.864	2.879	4.159
Commercial Distributed Generation - MWp Total New 25% Solar Electric PV	0.226	0.401	0.685	1.059	1.529
Commercial Distributed Generation - MWp Total New 75% Non Solar Electric @ ave 50% CF	0.264	0.466	0.798	1.233	1.780
Distributed Solar Elect MWp Old With Multipliers	0.24	0.24	0.24	0.24	0.24
Utility Solar Elect MWp Old With Multipliers	0.02	0.02	0.02	0.02	0.02
Utility Fueled Generation - MWp Old With Multipliers	0.000	0.000	0.000	0.000	0.000
Utility Generated @ 80% NonDispatchable Energy - MWp New No Multipliers - Wind	11.500	12.815	15.479	17.937	20.150
Utility Generated @ 20% Fueled - MWp New No Multipliers	0.632	0.704	0.850	0.985	1.107
Resulting Total Solar Electric Capacity in MW	0.918	1.488	2.633	4.135	6.027
Resulting Total Solar Electric Annual Energy in MWh	2,483	3,490	5,135	7,293	10,011
Incremental Solar Capacity Watts Installed per Year per Person	3.724	3.165	6.382	8.343	10.509
Resulting Total Distributed Solar Hot Water Heating Capacity in MW	1.000	1.770	3.029	4.679	6.758
Resulting Total Distributed Solar Water Heating Annual Energy in MWh	1,000	1,770	3,029	4,679	6,758
Resulting Total Distributed Non Solar Electric Dispatchable or Displaced Generation Capacity in MW	0.176	0.311	0.532	0.822	1.187
Resulting Total Distributed Non Solar Electric Dispatchable or Displaced Generation Annual Energy in MWh	770	1,362	2,330	3,599	5,198
Resulting Total Wind Electric Generation Capacity in MW	11.500	12.815	15.479	17.937	20.150
Resulting Total Wind Electric Generation Annual Energy in MWh	22,138	24,669	29,798	34,528	38,789
Resulting Total Biomass Electric Generation Capacity in MW	0.632	0.704	0.850	0.985	1.107
Resulting Total Biomass Electric Generation Annual Energy in MWh	5,535	6,167	7,449	8,632	9,697
Total Renewable Generating Annual Energy in MWh	31,926	37,458	47,741	58,732	70,454
Total Renewable Generating Capacity in MW	14.227	17.088	22.524	28.558	35.228
Residential Distributed Electric Credit Balance	0	0	0	0	0
Commercial Distributed Energy Credit Balance	0	0	0	0	0
Utility Generated Electric Credit Balance	1,494	1,484	1,469	1,449	1,424
Residential Distributed Generation Solar Electric %	60.00%	60.00%	60.00%	60.00%	60.00%
Residential Distributed Generation Up Front Solar Electric Subsidy Program \$/Watt DC	\$4.50	\$4.50	\$4.00	\$4.00	\$3.30
Additional Residential Distributed Solar Electric Capacity Needed in MWp this given Year	0.444	0.526	0.861	1.128	1.421
Subtotal Cost of Residential Distributed Solar Electric Subsidies	\$1,998,107	\$2,368,861	\$3,442,024	\$4,513,398	\$4,690,314
Residential Distributed Solar Hot Water & Wind Up Front Subsidy Program \$/Watt AC Equivalent	\$1.0000	\$1.0000	\$0.9000	\$0.9000	\$0.7500
Additional Residential Distributed Solar Hot Water & Wind Capacity Needed in MWp this given Year	0.816	0.474	0.774	1.016	1.279
Subtotal Cost of Residential Distributed Solar Hot Water & Wind Subsidies	\$615,621	\$473,772	\$697,010	\$913,963	\$959,382
Distributed Generation Solar Electric %	25.00%	25.00%	25.00%	25.00%	25.00%
SubTotal Cost of Distributed Solar Electric Generation Feed In Tariff	\$69,257	\$191,814	\$380,529	\$672,064	\$1,030,739
Unit Built in 2008	\$69,257	\$69,257	\$69,257	\$69,257	\$69,257
Unit Built in 2009		\$122,557	\$122,557	\$122,557	\$122,557
Unit Built in 2010			\$188,715	\$188,715	\$188,715
Unit Built in 2011				\$291,536	\$291,536
Unit Built in 2012					\$358,674
Unit Built in 2013					
Unit Built in 2014					



Distributed Generation Non Solar	Electric Energy Feed In Tariff Plan - Solar Thermal, Solar Cooling, Wind, Biomass & Daylighting. Applies to all non residential solar electric in all years. UCPP	Distributed Electric Fee Applies to all residential electric in years. UCPP	Unit Built in 2015						
			Unit Built in 2016						
UNSE	Generated Renewable Power	Other RES Program Costs	Unit Built in 2017						
			Unit Built in 2018						
DG Program Subtotal	Percent of Total RES Program Costs	Total Program Expenses	Unit Built in 2019						
			Unit Built in 2020						
Distributed Program % of Total Program	Total REST Program Cost	Program Revenue Streams	Feed In Tariff Rate for 20 years \$/kWh	\$0.1800	\$0.1800	\$0.1620	\$0.1620	\$0.1380	
			SubTotal Cost of Non Solar Electric Distributed Energy	\$57,714	\$159,845	\$317,107	\$560,054	\$871,944	
Cumulative Program \$ Balance	Cumulative Gain (Loss) (Subsidy Program)	Annual Program \$ Balance	Feed In Tariff	\$57,714	\$57,714	\$57,714	\$57,714	\$57,714	
			Unit Built in 2008						
Variable Assumptions	Landfill Gas MWp	Central Solar Conversion Rate	Unit Built in 2009		\$102,131	\$102,131	\$102,131	\$102,131	
			Unit Built in 2010			\$157,262	\$157,262	\$157,262	
Program Assumptions	Distributed Solar Conversion Rate	Distributed Renewable Conversion Rate	Unit Built in 2011				\$242,946	\$242,946	
			Unit Built in 2012					\$311,891	
Variable Assumptions	Solar Thermal Conversion	Dispatchable Conversion Rate	Unit Built in 2013						
			Unit Built in 2014						
Variable Assumptions	Wind Conversion Rate	OG Energy Rating	Unit Built in 2015						
			Unit Built in 2016						
Variable Assumptions	Wind Conversion Rate	OG Energy Rating	Unit Built in 2017						
			Unit Built in 2018						
Variable Assumptions	Wind Conversion Rate	OG Energy Rating	Unit Built in 2019						
			Unit Built in 2020						
Variable Assumptions	Wind Conversion Rate	OG Energy Rating	Feed In Tariff Rate for 20 years \$/kWh	\$0.0500	\$0.0500	\$0.0450	\$0.0450	\$0.0400	
			Above Market Premium of Self Generated or Purchased Renewable Power Including Transmission After 2009	\$0.0154	\$0.0154	\$0.0154	\$0.0255	\$0.0255	
Variable Assumptions	Wind Conversion Rate	OG Energy Rating	Cost of Self Generated or Purchased Renewable Power	\$424,840	\$473,402	\$571,821	\$1,101,457	\$1,237,372	
			Grid Integration Rate in \$/MWh	\$0.00	\$0.00	\$0.00	\$2.00	\$3.00	
Variable Assumptions	Wind Conversion Rate	OG Energy Rating	Large Scale Grid Integration Costs in \$	\$0.00	\$0.00	\$0.00	\$43,190.45	\$72,774.45	
			Administrative Costs & Integration Costs & Outreach and Advertising & Net Metering costs	\$1,110,213	\$1,127,409	\$1,271,094	\$1,458,155	\$1,657,340	
Variable Assumptions	Wind Conversion Rate	OG Energy Rating	Distributed Generation & DG Admin and DG Integration Program Costs	\$3,850,913	\$4,321,702	\$6,107,764	\$8,074,444	\$9,136,944	
			Percent of Total RES Program Costs	90.06%	90.13%	91.44%	87.58%	87.46%	
Variable Assumptions	Wind Conversion Rate	OG Energy Rating	Total REST Program Cost	\$4,275,753	\$4,795,104	\$6,679,586	\$9,219,091	\$10,447,091	
			Credit Sales MWh	0	0	0	0	0	
Variable Assumptions	Wind Conversion Rate	OG Energy Rating	Green Sales MWh	6	10	15	20	25	
			Credit Sales \$/MWh	\$0	\$0	\$0	\$0	\$0	
Variable Assumptions	Wind Conversion Rate	OG Energy Rating	Green Sales \$/MWh	\$85	\$85	\$85	\$85	\$85	
			Renewable Product Sales Income	\$508	\$847	\$1,270	\$1,694	\$2,117	
Variable Assumptions	Wind Conversion Rate	OG Energy Rating	EPS Carryover Revenue	\$0	\$220,000	\$500,000	\$600,000	\$600,000	
			REST Surcharge/Sample Tariff Income	\$4,464,137	\$4,585,562	\$6,100,000	\$8,550,000	\$9,820,000	
Variable Assumptions	Wind Conversion Rate	OG Energy Rating	Investment Tax Credit	\$0	\$0	\$0	\$0	\$0	
			Finance Cost @ 10% or Investment @ 5%	\$0	(\$9,445)	(\$9,538)	(\$5,145)	(\$1,518)	
Variable Assumptions	Wind Conversion Rate	OG Energy Rating	Total EPS Program Revenue	\$4,464,645	\$4,796,964	\$6,591,733	\$9,146,549	\$10,420,600	
			Total EPS Program Annual Balance (Subsidy Program)	\$188,893	\$1,860	(\$87,853)	(\$72,542)	(\$26,492)	
Variable Assumptions	Wind Conversion Rate	OG Energy Rating	Cumulative Gain (Loss) (Subsidy Program)	\$188,893	\$190,753	\$102,900	\$30,358	\$3,866	
			Cumulative REST Program Expenditures	\$4,275,753	\$9,070,856	\$15,750,442	\$24,969,533	\$35,416,624	
Variable Assumptions	Wind Conversion Rate	OG Energy Rating	Landfill Gas MWp	5 MWp					
			Central Solar Conversion Rate	1700 MWh/MWp					
Variable Assumptions	Wind Conversion Rate	OG Energy Rating	Distributed Solar Conversion Rate	1350 MWh/MWp					
			Distributed Renewable Conversion Rate	1000 MWh/MWp					
Variable Assumptions	Wind Conversion Rate	OG Energy Rating	Solar Thermal Conversion	2840 MWh/MWp					
			Dispatchable Conversion Rate	8760 MWh/MWp					
Variable Assumptions	Wind Conversion Rate	OG Energy Rating	Wind Conversion Rate	1925 MWh/MWp					

#### Assumptions:

UNSE manages the Distributed Generation Program  
60% of residential distributed is solar electric. The other 40% is solar hot water and wind. Paid for with up front subsidy through 2012  
25% of Commercial distributed is solar electric. The other 75% is solar hot water heating, solar cooling, wind, biomass or daylighting. Paid for with a 20 year locked feed in tariff after 2007 through 2030.  
The cost of renewable energy purchased through RFPs and generated by UNSE in the future initially will be \$0.0154 per kWh above the market price for energy purchased at the same time the renewable energy was generated.  
The cost of transmission after 2012 to bring the needed amounts of 50% wind to UNSE will be based on a transmission cost of \$0.035 cents per kWh on a 20% capacity factor line, in 2013 with reduction to market in 2030.  
All renewable generation sources for UNSE can be integrated into the existing transmission structure through 2012.  
This scenario does not include reductions from Global Solar credit production.  
Energy sales and subsidy revenue growth is 2.72% per year. Assumes the REST reduces customer energy load growth due to the new self generation ins and DSM reduces load growth also.  
Annual energy production rates for the various technologies are based on historical data from the first five years of the UNSE EPS programs.  
The Feed In Tariff program has less risk of problems associated with customer generation production than the Up Front Subsidy Program given that there Grid Integration Costs based on Xcel/Minnesota Dept of Commerce Report of 2004, Idaho Power Report in 2007 and British report of 2006.  
Other REST Program Costs include: Interconnection application review costs, net metering costs, application processing costs, initial inspections, annual hearing costs.  
There is no energy storage anticipated during the 2008 through 2015 time frame. Storage will be needed after 2015 if unpredictable energy sources like  
Administrative costs assume one person per 500/kWp per year of new commercial or residential solar installations and two technical gurus for all levels of  
Ongoing annual inspection and repair work will be contracted out.  
Creation of a database with online access for customers and installers will add some cost in future.



# Renewable Energy Standard per 11/2006 Approved REST Rule. Sample Tariff Funding Plan

UNSE-600

UNSE & REST Program  
Factors

Renewable Resource Energy and Power Conversion

Annual  
Credit  
Balance  
es MWh

Assumption

Residential Solar  
Electric Up Front  
Subsidy Payment  
UCPP Plan

Distributed Solar  
Hot Water & Wind  
Up Front Subsidy  
Payment UCPP  
Plan

Assumption

Generation Solar  
ed In Tariff Plan -  
non residential solar  
all years. UCPP

Item	2008	2009	2010	2011	2012
RES Annual Renewable Energy Percentage	1.75%	2.00%	2.50%	3.00%	3.50%
Energy Sales - MWh Growth @ 2.72%/yr	1,762,733	1,826,544	1,881,244	1,945,323	2,015,532
Expected DSM Program Annual Energy Reductions	3,815	7,810	11,948	16,428	20,878
Expected DG Program Annual Energy Reductions	0	3,078	5,447	9,319	14,397
Net Retail Energy Sales in MWh per Year	1,758,918	1,815,656	1,863,849	1,919,576	1,980,257
Renewable Energy - MWh	30,781	36,313	46,596	57,587	69,309
Minimum Distributed Energy %	10.00%	15.00%	20.00%	25.00%	30.00%
Minimum Distributed Energy MWh	3,078	5,447	9,319	14,397	20,793
Minimum Residential Distributed Energy %	3.45%	7.50%	10.00%	12.50%	15.00%
Minimum Residential Distributed Energy MWh	1,062	2,723	4,660	7,198	10,396
Maximum Commercial Distributed Energy %	6.55%	7.50%	10.00%	12.50%	15.00%
Maximum Commercial Distributed Energy MWh	2,016	2,723	4,660	7,198	10,396
Residential Distributed Generation - MWp Total New 60% Solar PV	0.232	0.970	1.831	2.959	4.381
Residential Distributed Energy - MWp Total New 40% Solar Hot Water/Space Heating & Wind	0.425	1.089	1.864	2.879	4.159
Commercial Distributed Generation - MWp Total New 25% Solar Electric PV	0.296	0.401	0.685	1.059	1.529
Commercial Distributed Generation - MWp Total New 75% Non Solar Electric @ ave 50% CF	0.345	0.466	0.798	1.233	1.780
Distributed Solar Elect MWp Old With Multipliers	0.24	0.24	0.24	0.24	0.24
Utility Solar Elect MWp Old With Multipliers	0.02	0.02	0.02	0.02	0.02
Utility Fueled Generation - MWp Old With Multipliers	0.000	0.000	0.000	0.000	0.000
Utility Generated @ 80% NonDispatchable Energy - MWp New No Multipliers - Wind	11.500	12.815	15.479	17.937	20.150
Utility Generated @ 20% Fueled - MWp New No Multipliers	0.632	0.704	0.850	0.985	1.107
Resulting Total Solar Electric Capacity in MW	0.776	1.488	2.633	4.135	6.027
Resulting Total Solar Electric Annual Energy in MWh	2,316	3,490	5,135	7,293	10,011
Incremental Solar Capacity Watts installed per Year per Person	2.936	3.953	6.362	8.343	10.509
Resulting Total Distributed Solar Hot Water Heating Capacity in MW	0.929	1.770	3.029	4.679	6.758
Resulting Total Distributed Solar Water Heating Annual Energy in MWh	929	1,770	3,029	4,679	6,758
Resulting Total Distributed Non Solar Electric Dispatchable or Displaced Generation Capacity in MW	0.230	0.311	0.532	0.822	1.187
Resulting Total Distributed Non Solar Electric Dispatchable or Displaced Generation Annual Energy in MWh	1,008	1,362	2,330	3,599	5,198
Resulting Total Wind Electric Generation Capacity in MW	11.500	12.815	15.479	17.937	20.150
Resulting Total Wind Electric Generation Annual Energy in MWh	22,138	24,669	29,798	34,528	38,789
Resulting Total Biomass Electric Generation Capacity in MW	0.632	0.704	0.850	0.985	1.107
Resulting Total Biomass Electric Generation Annual Energy in MWh	5,535	6,167	7,449	8,632	9,697
Total Renewable Generating Annual Energy in MWh	31,926	37,458	47,741	58,732	70,454
Total Renewable Generating Capacity in MW	14.068	17.088	22.524	28.558	35.228
Residential Distributed Electric Credit Balance	0	0	0	0	0
Commercial Distributed Energy Credit Balance	0	0	0	0	0
Utility Generated Electric Credit Balance	1,494	1,484	1,469	1,449	1,424
Residential Distributed Generation Solar Electric %	60.00%	60.00%	60.00%	60.00%	60.00%
Residential Distributed Generation Up Front Solar Electric Subsidy Program \$/Watt DC	\$3.00	\$3.00	\$3.00	\$3.00	\$3.00
Additional Residential Distributed Solar Electric Capacity Needed in MWp this given Year	0.232	0.738	0.861	1.128	1.421
Subtotal Cost of Residential Distributed Solar Electric Subsidies	\$695,929	\$2,215,383	\$2,581,518	\$3,385,049	\$4,263,921
Residential Distributed Solar Hot Water & Wind Up Front Subsidy Program \$/Watt AC Equivalent	\$0.5000	\$0.5000	\$0.5000	\$0.5000	\$0.5000
Additional Residential Distributed Solar Hot Water & Wind Capacity Needed in MWp this given Year	0.425	0.865	0.774	1.016	1.279
Subtotal Cost of Residential Distributed Solar Hot Water & Wind Subsidies	\$212,389	\$332,307	\$387,228	\$507,757	\$639,588
Distributed Generation Solar Electric %	25.00%	25.00%	25.00%	25.00%	25.00%
SubTotal Cost of Distributed Solar Electric Generation Feed In Tariff	\$90,727	\$213,284	\$401,999	\$693,534	\$1,052,208
Unit Built in 2008	\$90,727	\$90,727	\$90,727	\$90,727	\$90,727
Unit Built in 2009		\$122,557	\$122,557	\$122,557	\$122,557
Unit Built in 2010			\$188,715	\$188,715	\$188,715
Unit Built in 2011				\$291,536	\$291,536
Unit Built in 2012					\$358,674
Unit Built in 2013					
Unit Built in 2014					



Distributed Generation Non Solar Electric Energy Feed In Tariff Plan - Solar Thermal, Solar Cooling, Wind, Biomass & Daylighting. Applies to all non residential solar electric in all years. UCPP	Distributed Electric Feed In Tariff Applies to all residential electric in all years. UCPP	Unit Built in 2015					
		Unit Built in 2016					
UNSE Generated Renewable Power	Other RES Program Costs	Unit Built in 2017					
		Unit Built in 2018					
DG Program Subtotal	Distributed Program % of Total Program	Unit Built in 2019					
		Unit Built in 2020					
Total Program Expenses	Program Revenue Streams	Feed In Tariff Rate for 20 years \$/kWh	\$0.1800	\$0.1800	\$0.1620	\$0.1620	\$0.1380
		SubTotal Cost of Non Solar Electric Distributed Energy	\$75,806	\$177,737	\$334,999	\$577,945	\$889,836
Annual Program Balance	Cumulative Program Balance	Feed In Tariff	\$75,806	\$75,806	\$75,806	\$75,806	\$75,806
		Unit Built in 2008		\$102,131	\$102,131	\$102,131	\$102,131
Cumulative Program Cost	Variable Assumptions	Unit Built in 2009			\$157,262	\$157,262	\$157,262
		Unit Built in 2010			\$242,946	\$242,946	\$242,946
Program Assumptions		Unit Built in 2011					\$311,891
		Unit Built in 2012					
		Unit Built in 2013					
		Unit Built in 2014					
		Unit Built in 2015					
		Unit Built in 2016					
		Unit Built in 2017					
		Unit Built in 2018					
		Unit Built in 2019					
		Unit Built in 2020					
		Feed In Tariff Rate for 20 years \$/kWh	\$0.0500	\$0.0500	\$0.0450	\$0.0450	\$0.0400
		Above Market Premium of Self Generated or Purchased Renewable Power Including Transmission After 2009	\$0.0154	\$0.0154	\$0.0154	\$0.0255	\$0.0255
		Cost of Self Generated or Purchased Renewable Power	\$424,840	\$473,402	\$571,821	\$1,101,457	\$1,237,372
		Grid Integration Rate in \$/MWh	\$0.00	\$0.00	\$0.00	\$2.00	\$3.00
		Large Scale Grid Integration Costs in \$	\$0.00	\$0.00	\$0.00	\$43,190.45	\$72,774.45
		Administrative Costs & Integration Costs & Outreach and Advertising & Net Metering costs	\$883,959	\$955,988	\$1,074,570	\$1,261,631	\$1,460,816
		Distributed Generation & DG Admin and DG Integration Program Costs	\$1,958,611	\$3,894,699	\$4,780,313	\$6,382,726	\$8,233,595
		Percent of Total RES Program Costs	82.18%	89.16%	89.32%	84.79%	86.27%
		Total REST Program Cost	\$2,383,451	\$4,368,101	\$5,352,135	\$7,527,373	\$9,543,742
		Credit Sales MWh	0	0	0	0	0
		Green Sales MWh	6	10	15	20	25
		Credit Sales \$/MWh	\$0	\$0	\$0	\$0	\$0
		Green Sales \$/MWh	\$85	\$85	\$85	\$85	\$85
		Renewable Product Sales Income	\$508	\$847	\$1,270	\$1,694	\$2,117
		EPS Carryover Revenue	\$260,000	\$500,000	\$500,000	\$500,000	\$260,000
		REST Surcharge/Sample Tariff Income	\$2,118,756	\$3,870,000	\$4,850,000	\$7,030,000	\$9,280,000
		Investment Tax Credit	\$0	\$0	\$0	\$0	\$0
		Finance Cost @ 10% or Investment @ 5%	\$0	\$419	\$102	\$178	(\$136)
		Total EPS Program Revenue	\$2,379,264	\$4,371,266	\$5,351,373	\$7,531,872	\$9,541,982
		Total EPS Program Annual Balance (Subsidy Program)	(\$4,186)	\$3,165	(\$762)	\$4,499	(\$1,760)
		Cumulative Gain (Loss) (Subsidy Program)	(\$4,186)	(\$1,022)	(\$1,784)	\$2,716	\$955
		Cumulative REST Program Expenditures	\$2,383,451	\$6,751,551	\$12,103,686	\$19,631,059	\$29,174,801
		Landfill Gas MWp	5 MWp				
		Central Solar Conversion Rate	1700 MWh/MWp				
		Distributed Solar Conversion Rate	1350 MWh/MWp				
		Distributed Renewable Conversion Rate	1000 MWh/MWp				
		Solar Thermal Conversion	2840 MWh/MWp				
		Dispatchable Conversion Rate	8760 MWh/MWp				
		Wind Conversion Rate	1925 MWh/MWp				
		OG Energy Rating					

#### Assumptions:

UNSE manages the Distributed Generation Program  
60% of residential distributed is solar electric. The other 40% is solar hot water and wind. Paid for with up front subsidy through 2012  
25% of Commercial distributed is solar electric. The other 75% is solar hot water heating, solar cooling, wind, biomass or daylighting. Paid for with a 20 year locked feed in tariff after 2007 through 2030.  
The cost of renewable energy purchased through RFPs and generated by UNSE in the future initially will be \$0.0154 per kWh above the market price for energy purchased at the same time the renewable energy was generated.  
The cost of transmission after 2012 to bring the needed amounts of 50% wind to UNSE will be based on a transmission cost of \$0.035 cents per kWh on a 20% capacity factor line, in 2013 with reduction to market in 2030.  
All renewable generation sources for UNSE can be integrated into the existing transmission structure through 2012.  
This scenario does not include reductions from Global Solar credit production.  
Energy sales and subsidy revenue growth is 2.72% per year. Assumes the REST reduces customer energy load growth due to the new self generation and DSM reduces load growth also.  
Annual energy production rates for the various technologies are based on historical data from the first five years of the UNSE EPS programs.  
The Feed In Tariff program has less risk of problems associated with customer generation production than the Up Front Subsidy Program given that there Grid Integration Costs based on Xcel/Minnesota Dept of Commerce Report of 2004, Idaho Power Report in 2007 and British report of 2006.  
Other REST Program Costs include: Interconnection application review costs, net metering costs, application processing costs, initial inspections, annual hearing costs.  
There is no energy storage anticipated during the 2008 through 2015 time frame. Storage will be needed after 2015 if unpredictable energy sources like  
Administrative costs assume one person per 500/kWp per year of new commercial or residential solar installations and two technical gurus for all levels of  
Ongoing annual inspection and repair work will be contracted out.  
Creation of a database with online access for customers and installers will add some cost in future.



# Attachment 9

**UNS Electric, Inc. Renewable Energy Standard & Tariff**  
**Sample Tariff Funding Plan**  
**Cost Recovery Factors Definition for 2008**

**Total REAP Budget 2008: \$2,283,451**

**Purchased Renewable Energy: \$451,840**

- Above Market Cost of Conventional Generation calculated annually on hourly data per MCCCCG Matrix **\$424,840<sup>aa</sup>**
- Transmission direct use cost **\$0**
- Transmission planning cost allocation **\$0**
- Transmission Line loss cost **\$0**
- Grid management ancillary services and day ahead unit commitment cost **\$0**
- Grid stability analysis cost allocation **\$5,000<sup>ab</sup>**
- Fuel and maintenance costs associated with increased combustion turbine use and operating load range ramp cycles to manage over/under scheduled renewable resource energy deliveries **\$0**
- RFP preparation, issue and evaluation cost **\$2,000<sup>ac</sup>**
- Independent Auditor cost **\$10,000<sup>ad</sup>**
- Loss of revenue from off system sales lost due to transmission constraints created by transmission allocated to renewable PPA energy delivery **\$0**
- Labor overhead allocation cost for purchased renewable power contracts **\$10,000<sup>ae</sup>**
- In state renewable resource economic development premium payment cost **\$0**

**Customer Sited Distributed Renewable Energy: \$1,622,711**

- Up front subsidy payment to customers cost **\$908,318<sup>ba</sup>**
- Annual production based performance payment to customers cost **\$166,333 190,458<sup>bb</sup>**
- Builder solar energy system subsidy program material cost **\$0<sup>bc</sup>**
- Interconnection and net meter application processing labor cost **\$5,000<sup>bd</sup>**
- Acceptance testing cost **\$10,000<sup>be</sup>**
- Customer technical support cost **\$5,000<sup>bf</sup>**
- Annual meter reading cost **\$1,000<sup>bg</sup>**
- Support tools, materials, transportation and supply cost **\$25,000<sup>bh</sup>**
- Direct internal labor cost for administration of the customer sited renewable generation program **\$10,000<sup>bi</sup>**
- Outside services and internal labor for public outreach, education program and GreenWatts.com website maintenance cost **\$550,070<sup>bj</sup>**

- Grid management cost \$0
- Grid stability analysis cost allocation \$0<sup>bk</sup>
- Cost of service contracts for outside labor for inspections and maintenance \$5,000<sup>bl</sup>
- Corporate overhead, Stores loads, Small Tools loads, Common Systems loads, Building allocation and other transaction allocation cost for customer sited renewable distributed generation programs \$16,108<sup>bm</sup>
- Loss of revenue from the fixed cost portion of customer charges displaced by customer self generation \$0

#### **Customer Care and Billing program (CC&B): \$50,000**

- Annual administrative CC&B cost allocation based on share of transactions processed \$25,000<sup>ca</sup>
- Initial database and customer interface program development and program revision cost \$0<sup>cb</sup>
- Capital A&G load allocations for above development work \$0<sup>cc</sup>
- CC&B incremental transaction allocation cost for CC&B support \$25,000<sup>cd</sup>

#### **Energy Management System and Energy Accounting and Settlements (EMS&EAS): \$85,000**

- Annual administrative EMS&EAS cost allocation based on share of transactions processed \$25,000<sup>da</sup>
- Initial database and program revision cost \$50,000<sup>db</sup>
- Capital A&G load allocations for above development work \$5,000<sup>dc</sup>
- Labor overhead allocation cost for EMS&EAS \$5,000<sup>dd</sup>

#### **Net Metering: \$8,400**

- Direct material cost for meters \$2,000<sup>ea</sup>
- Labor cost for meter installations \$2,000<sup>eb</sup>
- CC&B program revision cost \$4,000<sup>ec</sup>
- Direct energy credit purchase cost \$0
- Net metering rate design cost \$0
- Time of Use Net metering program development cost \$0<sup>ed</sup>
- Net Metering data interval recording for load research and program metrics evaluation \$0<sup>ee</sup>
- Communications for net metering data retrieval \$0<sup>ef</sup>
- Labor overhead, Stores load and CC&B transaction allocation cost for net metering programs \$400<sup>eg</sup>

## **Reporting: \$60,500**

- Annual Compliance Report and hearing cost \$5,000<sup>fa</sup>
- Annual Planning and Implementation Report and hearing cost \$25,000<sup>fb</sup>
- Annual Tariff review and hearing cost \$25,000<sup>fc</sup>
- Labor overhead and CC&B transaction allocation cost for reporting \$5,500<sup>fd</sup>

## **Outside Coordination and Support: \$5,000**

- Support through providing information and answering questions of national energy labs cost \$0<sup>ga</sup>
- Support through providing information and testing equipment of renewable energy equipment vendors cost \$0<sup>gb</sup>
- Responding to renewable energy questions from non UNSE customers cost \$0<sup>gc</sup>
- Support of outside service territory renewable energy interest cost \$0<sup>gd</sup>
- WREGIS and other renewable energy certification agency fee cost \$0
- Utility Wind Interest Group fee cost \$0<sup>ge</sup>
- Solar Electric Power Association fee cost \$0<sup>gf</sup>
- Other renewable energy association fees as needed cost \$0<sup>gg</sup>
- Training, travel, memberships, periodicals, etc cost \$5,000<sup>gh</sup>
- Labor overhead allocation cost for outside coordination and support \$0<sup>gi</sup>

## **Renewable Energy Hardware Development: \$0**

- Technology development projects – geothermal heat pumps, residential solar units, residential wind generation, etc cost \$0<sup>ha</sup>
- Energy storage demonstration project cost \$0<sup>hb</sup>
- Operation and maintenance of renewable generation systems cost \$0<sup>hc</sup>
- Renewable energy resource monitoring program cost \$0<sup>hd</sup>
- Support of Arizona wide renewable energy studies cost \$0<sup>he</sup>
- Up front funded renewable technology construction cost \$0<sup>hf</sup>
- Development of wind and solar forecasting program costs \$0<sup>hg</sup>
- Development of load shed systems for managing rapid changes in renewable energy generation levels cost \$0<sup>hh</sup>
- Property taxes, sales taxes and insurance for renewable energy hardware costs \$0<sup>hi</sup>
- Labor overhead, Stores loads, allocation cost for renewable energy hardware development \$0<sup>hj</sup>

**Notes:**

- aa: 27,673 MWh @ \$21.20 per MWh above cost of MCCCCG – Purchased Power. Contracts are in addition to existing power purchase contracts, costs are incremental and caused by renewable purchased power contracts.**
- ab: Annual analysis of hourly delivery intermittencies on grid stability, forecasting development – internal UNSE personnel, 50 hours. Evaluation time is in addition to existing power purchase analysis and due to time variant nature of wind power, costs are incremental and caused by renewable purchased power contracts.**
- ac: Internal development, review, posting, query response, evaluation, contract development and close out – internal UNSE personnel, 20 hours. RFPs are in addition to existing power purchase RFPs, costs are incremental and caused by renewable purchased power contracts.**
- ad: Historic cost basis.**
- ae: Contract administration, settlement review, payment approval, internal overhead – internal UNSE personnel, 100 hours. Contracts are in addition to existing power purchase contracts, costs are incremental and caused by renewable purchased power contracts.**
- ba: Residential – 60% will be PV. 0.102 MWDC of PV in 2008. @ \$3.00 per watt DC = \$0.306M. 40% will be SDWH. 0.308 MWT of SDWH in 2008. @ \$0.500 per watt = \$0.154M. Commercial – 25% will be PV with 0% as UFI and 100% as PBI – 0 MWDC in 2008. The 2008 total = \$459,941**
- bb: Commercial PBI – 25% \* 2,309 MWh/yr/ @ \$0.18 = \$0.103M. The other 75% commercial as thermal – 75% \* 2,309 MWh @ \$0.05/kWh = \$0.087M. The 2008 total = \$190,458**
- bc: Assumes 0 kWDC of pilot program @ \$10/wattDC.**
- bd: 0.05 people @ 350 units /person-year. Currently 200 units / person year productivity.**
- be: 0.2 people @ 400 units /person-year. Currently 200 units / person year productivity.**
- bf: 0.05 people @ 1000 units /person-year. Currently 400 units / person year productivity.**
- bg: 500 meter reads per year including reporting and processing of data into reports**
- bh: Vehicles, tools, consumables for 1 mobile units and 0.4 departmental personnel**
- bi: 0.1 supervisory/managerial people @ 1000 units /person-year. Currently 200 units / person year productivity.**
- bj: \$0.5M direct outreach education expense with providers plus 0.5 people managing program and contractors/service providers,**
- bk: Studies of solar time variant output impact on distribution grid. Review of solar capacity value. Used for matching grant funding. 0 person assigned.**

- bl: Used for annual inspections, customer support. Based on historic costs extrapolated to 1,200 customers from \$25,000/year for 300 customers.
- bm: Calculated as 10% of internal labor costs = \$3,100 plus 2% of transaction costs = \$13,008  
Total = \$16,108
- ca: Initial estimate – discovery in progress.
- cb: Initial estimate – discovery in progress.
- cc: Initial estimate – discovery in progress.
- cd: Initial estimate – discovery in progress.
- da: Initial estimate – discovery in progress.
- db: Initial estimate – discovery in progress.
- dc: Initial estimate – discovery in progress.
- dd: Initial estimate – discovery in progress.
- ea: 20 net meters @ \$50 per meter plus 20 SunShare meters @ \$50 per meter
- eb: 20 site installations @ \$100 per site.
- ec: Initial estimate – discovery in progress. Recovery over 1 year period.
- ed: Initial estimate – discovery in progress. Recovery over 1 year period.
- ee: Future One Quarter time for an energy analyst to collate data, prepare analysis and review cost impacts and effect on lost revenues of net metering.
- ef: Future One Quarter time for an energy analyst for on going program review and quality control review of net metering program.
- eg: Calculated as 10% of internal labor costs = \$400 plus 2% of transaction costs = \$0 Total = \$400
- fa: Historic cost basis, extrapolated to a larger program with more reporting factors.
- fb: Historic cost basis, extrapolated to a larger program with more reporting factors.
- fc: Historic cost basis, extrapolated to a larger program with more reporting factors.
- fd: Calculated as 10% of internal labor costs = \$5,500 plus 2% of transaction costs = \$0 Total = \$5,500
- ga: Historic cost basis, extrapolated to a larger program with more reporting factors. Program manager level respondent.

- gb: Historic cost basis, extrapolated to a larger program with more reporting factors. Program manager level respondent.**
- gc: Historic cost basis, extrapolated to a larger program with more reporting factors. Program manager level respondent.**
- gd: Historic cost basis, extrapolated to a larger program with more reporting factors. Administrative level respondent.**
- ge: Based on proposal.**
- gf: Historic based.**
- gg: Historic based. Biomass, Geothermal, etc.**
- gh: Historic based for 4 employees.**
- gi: Calculated as 10% of internal labor costs = \$0 plus 2% of transaction costs = \$0 Total = \$0**
- ha: Estimated based on project size and mix.**
- hb: Estimated based on project size and mix.**
- hc: Historic based. OH, DMP and SGSSS**
- hd: Historic based.**
- he: Historic based.**
- hf: Operating Headquarters Test Yard – 0 kWDC**
- hg: Matching funds for grants in application.**
- hh: Matching funds for grants in application.**
- hi: Historic based.**
- hj: Calculated as 10% of internal labor costs = \$0 plus 2% of transaction costs = \$0 Total = \$0**



# EXHIBIT 2a



**Renewable Energy Standard & Tariff Surcharge  
REST-TS1  
Renewable Energy Program Expense Recovery  
(Sample Tariff Funding Plan)**

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APPLICABILITY

Mandatory, non-bypassable surcharge applied to all energy consumed by all customers throughout Company's entire electric service area.

RATES

For all energy billed which is supplied by the Company to the customer, the price shall be \$0.004988 per kWh of metered monthly energy consumption on all kWh consumed per meter that month over 500 kWh up to and including a monthly cap of:

For residential customers: \$1.05 per month.

For small commercial customers: \$39.00 per month.

For large commercial customers: \$117.00 per month.

A large commercial customer is one with monthly demand in excess of 3,000 kW for the three consecutive months preceding the current billing period.

For non-metered services, the lesser of the load profile or otherwise estimated kWh required to provide the service in question, or the service's contract kWh shall be used in the calculation of the surcharge.

This charge will be a line item on customer bills reading "Arizona Corporation Commission Renewable Energy Standard & Tariff."

RULES AND REGULATIONS

The standard Rules and Regulations of the Company as on file with the Arizona Corporation Commission shall apply where not inconsistent with this tariff.

TAX CLAUSE

To the charges computed under the above rate, including any adjustments, shall be added the applicable proportionate part of any taxes or governmental impositions which are or may in the future be assessed on the basis of gross revenues of the Company and/or the price or revenue from the electric energy or service sold and/or the volume of energy generated or purchased for sale and/or sold hereunder.

RELATED SCHEDULES

- UNS Electric, Inc. – Rules and Regulations

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Filed By: Raymond S. Heyman  
Title: Senior Vice President  
District: Entire Electric Service Area

Tariff No.: REST-TS1  
Effective: Pending  
Page No.: 1 of 1



# EXHIBIT 2b

**Description of Renewable Energy Standard & Tariff  
Adjustor Mechanism Tariff Rate  
UNS Electric, Inc. - Sample Tariff Funding Plan**

**Concept:**

- All customers will be billed for Renewable Energy Standard & Tariff ("REST") programs on a \$0.004988 per kWh of energy consumed in a given month as then capped monthly. However, different customer classes will be capped at different monthly levels as follows:
  - Residential customers will be billed the REST Tariff Surcharge rate on the amount of metered monthly energy consumption up to 211 kWh which is equal to a monthly cap of \$1.05. Amounts of consumption above 211 kWh per month will not be assessed a REST Tariff Surcharge.
  - Small Commercial customers will be billed the REST Tariff Surcharge rate on the amount of metered monthly energy consumption up to 7,819 kWh which is equal to a monthly cap of \$39.00. Amounts of consumption above 7,819 kWh per month will not be assessed a REST Tariff Surcharge.
  - Large Commercial customers will be billed the REST Tariff Surcharge rate on the amount of metered monthly energy consumption up to 23,457 kWh which is equal to a monthly cap of \$117.00. Amounts of consumption above 23,457 kWh per month will not be assessed a REST Tariff Surcharge.
  - A large commercial customer is one with monthly demand in excess of 3,000 kW for the three consecutive months preceding the current billing period.
  - All fixed monthly rate, non-metered, customers will be billed the REST Tariff Surcharge rate on the lesser of the load profile or otherwise estimated energy in kWh required to provide the service, or the service's contract energy amount in kWh shall be used in the calculation of the surcharge.

**Rate Structure for Subject Year:**

REST Tariff Surcharge rate = \$0.004988 per kWh of applicable metered monthly consumption per month to the cap values.

## Sample Bill Example Calculations:

Residential customer consumes 450 kWh in the month. Only the first 211 kWh are used in the calculation. Therefore the REST charge = \$1.05 for the month. This represents an average consumption of 0.6 kW for all hours of the month, a bit less than average.

*(Average year round UNS Electric residential customer monthly consumption is about 872 kWh which represents average consumption of 1.19 kW for all hours of the month.)*

Residential customer consumes 1,250 kWh in the month. Only the first 211 kWh are used in the calculation. Therefore the REST charge = \$1.05 for the month. This represents an average consumption of 1.7 kW for all hours of the month, a bit more than average.

Residential customer consumes 8,250 kWh in the month. Only the first 211 kWh are used in the calculation. Therefore the REST charge = \$1.05 for the month. This represents an average consumption of 11.5 kW for all hours of the month, a lot more than average.

A small Commercial customer consumes 3,250 kWh in the month. Therefore the REST charge = \$16.21 for the month. This represents an average consumption of 4.5 kW for all hours of the month.

A medium Commercial customer consumes 24,250 kWh in the month. Only the first 7,819 kWh are used in the calculation. Therefore the REST charge = \$39.00 for the month. This represents an average consumption of 34 kW for all hours of the month.

A large Commercial customer consumes 75,250 kWh in the month. Only the first 7,819 kWh are used in the calculation. Therefore the REST charge = \$39.00 for the month. This represents an average consumption of 104.5 kW for all hours of the month.

A medium size Industrial customer consumes 3,275,000 kWh in the month. Only the first 23,457 kWh are used in the calculation. Therefore the REST charge = \$117.00 for the month. This represents an average consumption of 4,549 kW for all hours of the month.



# EXHIBIT 2c

**UNS Electric, Inc. Uniform Credit Purchase Program**

**Sample Tariff Funding Plan**

**Renewable Energy Credit Purchase Program**

**(RECPP)**

**Definition**

## **UNS Electric, Inc. Renewable Energy Credit Purchase Program (RECPP)**

UNS Electric, Inc. ("UNS Electric") is committed to assisting our customers develop their own renewable generation resources, through a balanced and supportive renewable energy distributed generation incentive program. Our goal is to create a program that will provide incentives for affordable, environmentally sensitive, customer-sited renewable energy generation systems to supplement UNS Electric customer's energy needs. A properly designed system, matched to a customer's energy use, will provide a reduction in utility bills through the use of renewable resources. This program reflects our commitment to reduce the cost of developing renewable energy resources in partnership with our customers and help provide our customers with clean energy options.



## Defined Terms

**ACC** – Arizona Corporation Commission.

**AZROC** – Arizona Registrar of Contractors.

**Applicant** – Utility customer of record for the Utility Revenue Meter located at the installation site; a builder of the structure (residential or non-residential) who will reserve and install the Qualifying system; or for an off-grid Qualifying System, the property owner for the installation site located within a Utility's service territory.

**Arizona Business License** – A business license issued by the ACC.

**Cancelled** – Reservation Status indicating that a Reservation has been terminated, funding is no longer allocated, and the utility has removed the reservation from the funding queue.

**Cancellation** – The termination of the Reservation.

**Commissioned** – Qualifying System certified to be in operation.

**Commissioning Package** – Written verification signed by the installer and the customer confirming that the system has been installed in conformance with the approved reservation and that the system is ready for operation.

**Conforming Project** – Any project utilizing a renewable technology listed in Attachment D.

**Conformance Inspection** – Inspection performed by the utility to verify that the system has been installed and operates in conformance with the Reservation application.

**Customer** -- Utility customer of record for the Utility Revenue Meter located at the installation site or a builder of the structure (residential or non-residential) who will reserve and install the Qualifying System.

**Extension** – The extension of the Reservation Timeframe.

**Installer** – The entity or individual responsible for the installation of a qualifying system.

**Interconnection Inspection** – Inspection performed by the utility to confirm that the system can be safely interconnected to the power grid.

**Non-Conforming Project** – Non-conforming projects include, but are not limited to, projects with staged completion dates, multi-customer or multi-system projects, projects involving more than one technology, projects requiring new or unique agreement terms, projects with technologies for which qualification standards have not been developed or projects requiring non-standard timeframes.

**Performance Based Incentive (PBI)** – Incentive based on a rate per kWh output or equivalent kWh of energy savings.

**Project Costs** – System Costs plus financing costs.

**Proof of Project Advancement** – Documentation demonstrating that a project is progressing on schedule and is staged for Commissioning on or before the end of the Reservation Timeframe.

**Qualifying System** – Distributed renewable energy systems meeting the qualifications for production of qualified Renewable Energy Credits in Arizona acceptable to the Arizona Corporation Commission as they may be defined for affected utilities to meet any renewable energy standards.

**Renewable Energy Credit (REC)** – One Renewable Energy Credit is created for each kWh, or kWh equivalent for non-generating resources, derived from an eligible renewable energy resource. RECs shall include all environmental attributes associated with the production of the eligible renewable energy resource.

**Reservation** – A dollar amount committed by the utility to fund a project if all program requirements are met.

**Reservation Status** – Indicator relating to approval or denial of a Reservation request. If a Reservation is approved, the Reservation Status is Reserved. If a Reservation request is denied, the Reservation Status is either Cancelled or Wait Listed.

**Reserved** – Status indicating the acceptance of a Reservation request.

**Reservation Timeframe** – The duration of the utility's funding commitment for a Reservation.

**System Costs** -- Costs associated with the Qualifying System components, direct energy distribution, system control/metering, and standard installation costs directly related to the installation of the Qualifying System.

**Up Front Incentive (UFI)** – One time incentive payment based on system capacity or estimated energy kWh production rather than on measured system output.

**Wait List** – Status indicating Applicant has met program requirements, but the Utility has insufficient funding to commit to funding the project.

## **UNS Electric Renewable Energy Credit Purchase Program (RECPP) Review Panel**

UNS Electric will participate in a RECPP Review Panel for ongoing review and modification of all Renewable Distributed Generation programs, as prescribed by the ACC. UNS Electric believes that the Review Panel making recommendations to expeditiously modify all UNS Electric renewable programs is critical to its ultimate success. Program elements may need to be adjusted to reflect new information, changing market conditions, incorrect initial assumptions, or technological innovations.

### **Panel Structure and Function**

The Review Panel will be a five member panel created and maintained to provide on-going review of all renewable distributed generation program modifications and to efficiently facilitate incorporation of features that increase program efficacy as more information is gained by program implementation. The panel will make recommendations to the UNS Electric Renewable Energy program management for review and potential program incorporation.

The panel make-up includes one representative from the ACC staff, two representatives from the Mohave County and/or Santa Cruz County area renewable distributed generation industry, and two representatives from UNS Electric. The industry representatives should not exceed one each from a technology type and should reflect the diversity of technologies and consumer types available in the Mohave County or Santa Cruz County areas.

No renewable distributed generation industry representative shall serve more than one four year term.

The Review Panel shall make recommendations for consideration on the following subjects:

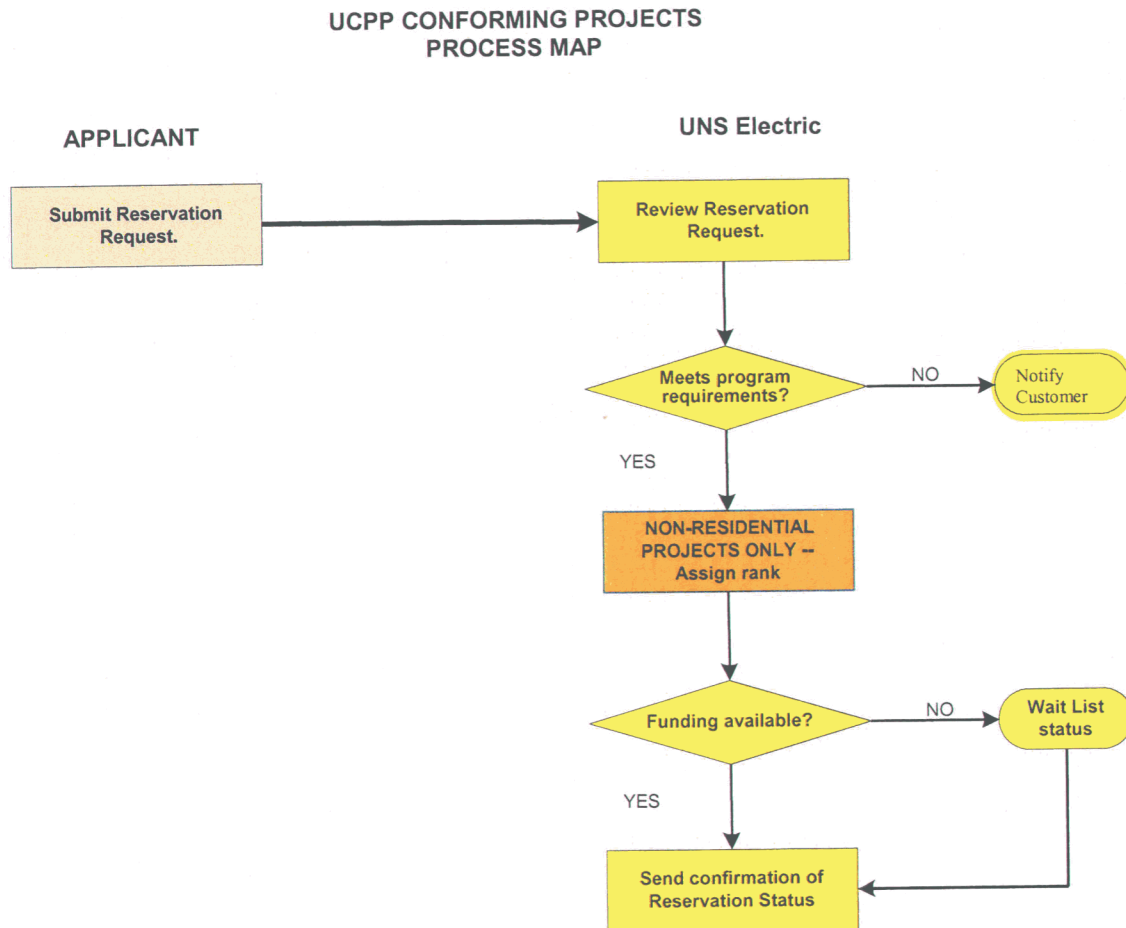
- Adjustment of incentive structures to reflect market response
- Process related issues that affect market function
- Development of new conforming incentives, as necessary
- Arbitration of incentive or program borne conflicts

The Review Panel should meet twice per year (or more often as necessary) to assess the items related to the above-described purpose. The Review Panel will review input from stakeholders on items before it for consideration, and it is anticipated that on occasion stakeholders may be consulted by the Review Panel to provide additional input. Upon full consideration of an item, the Review Panel will vote on adoption of the specified recommendation. A super-majority majority vote of at least four affirmative votes on a subject would result in a recommendation for consideration and potential incorporation into the RECPP. UNS Electric requests Commission approval of authority to implement unanimous five affirmative vote recommendations of the Review Panel without further Commission review and approval. For conditions where a unanimous vote is not achieved, the Commission will have the final approval authority.

## Process Map – Conforming Projects

UNS Electric mapped the RECPP process for conforming projects to illustrate the flow of information between the applicant and UNS Electric. The following sections reflect the recommended process flow.

### Step 1 – Reservation Request and Assignment of Reservation Status



#### Process Map Description – Step 1

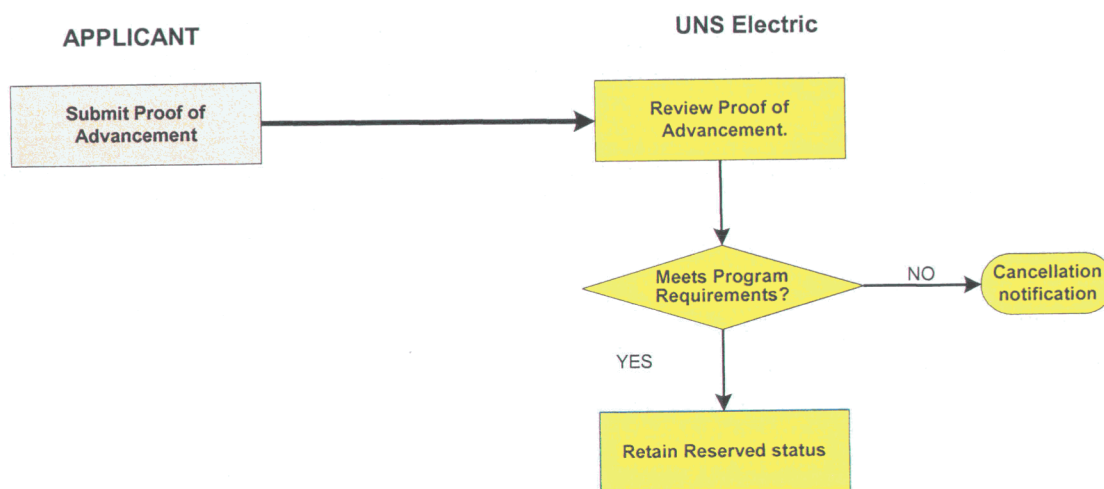
The first input UNS Electric receives from the customer is the reservation request. UNS Electric will review the reservation request to ensure the application conforms to program requirements. Residential reservation requests are processed on a first-come, first-served basis. Non-residential reservation requests are assigned a rank based on the lowest expected life cycle credit purchase cost. Additional detail on non-residential reservations is provided in the incentives section of this report.

After reviewing the reservation request, UNS Electric will assign a reservation status. If the reservation request is approved, UNS Electric will send a confirmation to the applicant. If the reservation request is denied because the request is not in compliance with program requirements, UNS Electric will send notification to the applicant of the discrepancies and that the request will be cancelled. Similarly, if the

reservation request is denied because funding is not available, UNS Electric will send a notification to the applicant that the request will be placed on a waiting list.

Residential reservation requests will be reviewed within 30 days of the utility's receipt of the request. Non-residential reservation requests will be reviewed within 90 days of UNS Electric's receipt of the request. Further detail relating to reservation periods is provided under the section titled Incentive Allocation.

### Step 2 – Proof of Advancement Process Map



#### Process Map Description – Step 2

The applicant must submit proof of advancement to UNS Electric to retain his or her reservation within the timeframes outlined below. At a minimum, the Proof of Project Advancement documentation for a non-residential application greater than 20 kWac will include:

- A project agreement (between customer and installer);
- An executed installation agreement including all project participants;
- Building and/or construction permits and/or a full set of design development or construction drawings (80% or more complete); and
- An executed interconnection agreement (if applicable).

Residential customers and non-residential customers installing a renewable energy system with rated production capacity of 20 kWac or less must provide copies of City/County construction permits to UNS Electric.

The timeline for proof of project advancement is based on the date of reservation confirmation and must be provided by the customer in accordance with the following schedule:

**Residential**

60 Days

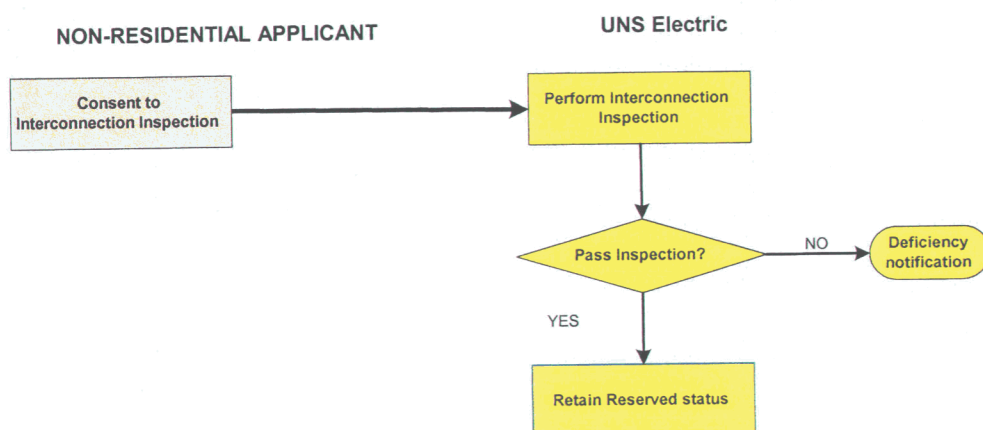
**Non-Residential  $\leq 20,000$  watts****AC capacity equivalent**

60 Days

**Non-Residential  $> 20,000$** **watts AC capacity equivalent**

120 Days

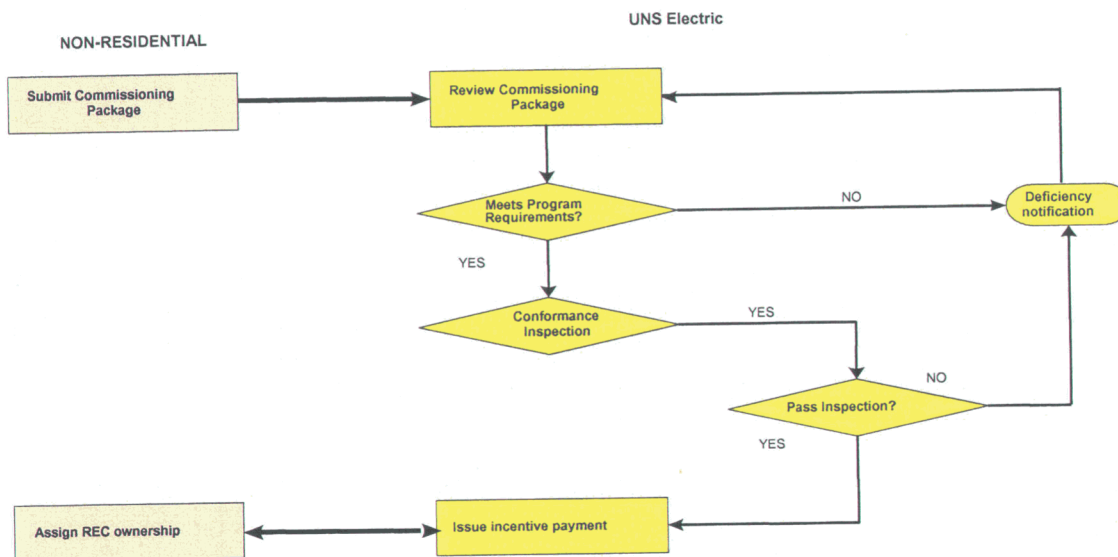
If proof of project advancement is not received within the specified timeframe, the customer will be notified that the reservation is cancelled. The applicant has the option to reapply for funding after the reservation has been cancelled. The request will be processed in the same manner as a new project reservation and will be contingent upon availability of funding.

**Step 3 – Interconnection Inspection (for Grid-Tied Qualifying Systems with capacity larger than 20 kWac)****Process Map Description – Step 3**

Non-residential grid-tied qualifying systems of electrical generating capacity larger than 20 kWac must submit to and pass an interconnection inspection before the system can be commissioned. UNS Electric conducts the interconnection inspection and will notify the applicant of the results of the inspection. If the system passes the inspection, the application retains the reservation. The applicant can keep the reservation even if the system fails the initial inspection, as long as the deficiency is remedied within the defined reservation timeframe described in Step 2.



## Step 4 – System Commissioning For Non-Residential Systems with capacity Larger Than 20 kWac



### Process Map Description for System Commissioning Non-Residential Customers – Step 4

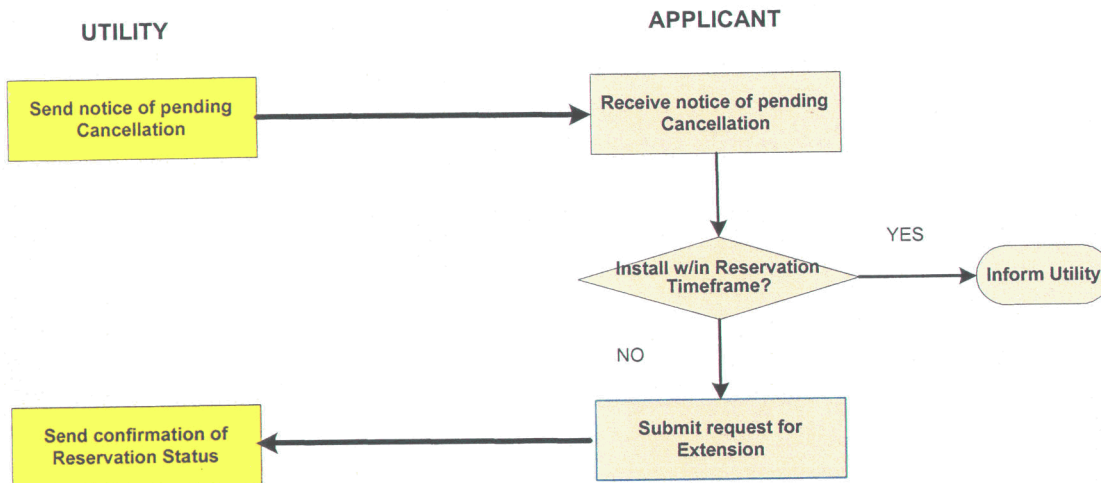
After the Non-Residential system has been commissioned, the applicant must submit a commissioning package to UNS Electric. UNS Electric will review the commissioning package and confirm that all program requirements have been met, including passing the interconnection inspection. For systems with capacity larger than 20 kWac, UNS Electric may, at its discretion, perform a conformance inspection of the system. UNS Electric will notify the applicant of the scheduled conformance inspection and the applicant must make the system available for inspection. In some cases, an incentive payment may not be issued until after a qualifying system has passed the conformance inspection.

Residential customers and non-residential customers with systems of capacity 20 kWac and less will notify UNS Electric that their installation is complete. UNS Electric will perform an acceptance test to verify installation and system performance after receiving copies of City/County permit.

Residential customers and non-residential customers with systems of capacity 20 kWac and less, who are receiving a UFI payment, and have met all program requirements, will receive the incentive payment within thirty days of successful acceptance. After UNS Electric issues the UFI payment to the applicant, UNS Electric is assigned exclusive rights to all the RECs associated with the generation produced from the qualifying system for a period of at least twenty years.

Systems receiving PBI payments will report production, receive payment, and release all RECs in conformance with the detail described in this report under the sections titled *Procedures for Production Based Incentives and Distributed Generation Incentives*.

## Conditionally Required Step - Cancellations



### Process Map Description – Cancellations

Unless an extension is granted, as described below, a reservation request will be cancelled if all program requirements have not been met with the reservation timeframe.

The reservation timeframe is determined in accordance with the following schedule:

<b>Residential</b>	<b>Non-Residential <math>\leq</math> 20,000 watts ac capacity equivalent</b>	<b>Non-Residential <math>&gt;</math> 20,000 watts ac capacity equivalent</b>
180 Days from Reservation Confirmation Date	180 Days from Reservation Confirmation Date	365 Days from Reservation Confirmation Date

UNS Electric will notify the applicant of the pending cancellation in accordance with the following schedule:

<b>Residential</b>	<b>Non-Residential <math>\leq</math> 20,000 watts ac capacity equivalent</b>	<b>Non-Residential <math>&gt;</math> 20,000 watts ac capacity equivalent</b>
30 Days Prior to Cancellation	30 Days Prior to Cancellation	60 Days Prior to Cancellation

### **Extensions**

UNS Electric will grant an extension for up to 90 days following timely receipt of a customer's request for extension. UNS Electric may approve written extension requests detailing the conditions for delay for periods beyond 90 days under extenuating circumstances.

### **Operations Monitoring**

All customers receiving renewable energy self-generation incentives are obligated to report system production to UNS Electric in accordance with the reporting schedule established in the program



agreement between UNS Electric and the customer. UNS Electric, at its option, may perform periodic inspection of the system for operation, metered production, and reporting purposes.

### **Procedures for Production Based Incentives**

Each project eligible for a PBI requires a project agreement between the applicant(s) and UNS Electric that will detail the assignment of energy and RECs and the assignment of payment. All PBI Project Agreements will include the following requirements:

1. Meters certified according to the UNS Electric standards that provide readings in kWh will be provided by UNS Electric as part of the system commissioning package.
2. Quarterly meter reads will be performed by UNS Electric and quarterly payments will be made to the assigned payee within 30 days, based on quarterly kWh production. If the payment due is less than \$25.00, it will be held for the next payment period.
3. PBI payments will begin with the first quarterly production following receipt of the completed system commissioning package and commissioning test, if required, and continue for the life of the agreement term. As part of this provision, it is understood that systems commissioned mid-quarter will receive payment only for the production of that partial quarter.

### **Installer Qualifications**

All systems receiving incentives under the RECPP must be installed by a qualified installer. The following requirements must be submitted by the applicant as part of the reservation request. UNS Electric will verify that the installer meets the following minimum qualifications prior to confirming a reservation request:

1. The installer must possess a valid license on file with the AZROC with a license classification appropriate for the technology being installed or the installer must identify use of a contractor holding an appropriate license on file with the AZROC for the technology being installed. A copy of the AZROC license must be provided as part of the reservation request.
2. The installer must possess an Arizona business license that is active and in good standing.

Installers may request that the above information be retained on file with UNS Electric; however, under this option the installer must certify that the information on file remains current with the submission of each reservation request. Information on file must be renewed yearly.

### **Installations By Customer (Residential Photovoltaic and Wind Only)**

Residential customers may self-install photovoltaic and wind generators of capacity not to exceed 10 kWac providing they adhere to all applicable codes and standards. The customer installed systems are eligible for an incentive equal to 70% of the standard UFI, as otherwise listed in the incentive table, Attachment D. UNS Electric reserves the right to withdraw this self-install qualification condition at any time in the future, if UNS Electric finds self-installations are not adhering to the applicable codes and standards or are found to be of poor quality workmanship.

## **Energy Reporting**

UNS Electric will report on the productivity of all RECPP distributed renewable energy resource systems within the format of the annual renewable energy Compliance Report to the ACC. For PBI systems, UNS Electric will report on the actual metered production of each system as reported by the customer and confirmed by UNS Electric. For systems receiving a UFI, UNS Electric will report on the total installed capacity and metered production.

## **System Removal**

If receiving a UFI, customer shall not remove the Qualifying System or any components thereof from the premises until December 31<sup>st</sup> of the 20<sup>th</sup> full calendar year following completion of system installation of the renewable energy system, without express agreement of UNS Electric. If receiving a PBI, customer shall not remove the Qualifying System or any components thereof from the premises until the last day of the final month of the final full calendar year of the applicable incentive payment term in the Agreement following completion of system installation of the renewable energy system, without express agreement from UNS Electric. If customer removes the Qualifying System in violation of this provision, customer shall immediately reimburse UNS Electric all incentive amounts paid by UNS Electric to customer or on behalf of customer to an authorized third party.

In addition, if a Qualified System is removed, UNS Electric shall monitor that specific customer site to ensure that an additional incentive is not provided for any new distributed renewable energy resource system on that site until the REC contracted operational life of the original system has been completed.

UNS Electric shall attempt to monitor the number of missing or non-working distributed generation systems and shall summarize its observations in its annual Compliance Report.

## **Qualifying Distributed Renewable Energy Resource Technologies – Technology Criteria**

The following technology criteria are not intended to preclude the participation of any renewable energy technology approved for implementation under the RECPP. These criteria are aimed at detailing those technologies or application segments within a technology which have been reviewed in detail by UNS Electric and were accepted as eligible conforming projects for the RECPP. In addition, the following sections provide detail on those criteria required by participating technologies.

### General Criteria

UNS Electric acknowledges that many regulations and site specific requirements may apply to the installation of any one renewable energy technology. UNS Electric agrees that no requirement imposed by these technology criteria shall be imposed in conflict with any other governmental requirements. Any RECPP based requirement which is in conflict with a site specific governmental requirement shall be detailed in the reservation request. All qualifying systems must adhere to the following requirements in addition to the RECPP program requirements:

- The project must comply with applicable local, state, and federal regulations.
- Products must be installed according to manufacturers' recommendations.

- Installations must meet applicable governmental statutes, codes, ordinances, and accepted engineering and installation practices.
- Systems must be permitted and inspected by the jurisdiction having authority over construction projects in the customer's locale.
- All major system components must be new and must not have been previously placed in service in any other location or for any other application.
- All renewable electricity generation systems must include a dedicated performance meter (provided by UNS Electric) which allows for measurement of system energy production. Certain other non-electric renewable energy production systems, noted below, will require customer supplied metering for PBI payment calculation purposes.
- If the qualifying system is grid-tied, the system must meet Arizona Corporation Commission Interconnection Requirements for Self-Generation Equipment.

#### Referenced standards

Some technology-specific criteria reference third party standards. The requirements of those standards are fully applicable when referenced as part of technology specific criteria. UNS Electric notes that rapid growth in national and international renewable energy programs is resulting in greater need for the development of standardization in such areas as; design, implementation, performance measurement, system integrity, and installation. UNS Electric recognizes that new standards are likely to develop in the near future for technologies included in the RECPP and recommends that the new standards are examined for application in this program definition as they become available. The following standards or standard development bodies are referenced as part of the recommended technology criteria:

- The Active Solar Heating Systems Design Manual developed by the American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE) in cooperation with the Solar Energy Industries Association (SEIA) and the ACES Research and Management Foundation (the Design Manual).
- Arizona State Boiler Regulations (see R4-13-406).
- The select technology specific qualification developed by the California Energy Commission (CEC).
- Solar Rating and Certification Corporation (SRCC). The SRCC criteria and ratings can be viewed at [www.solar-rating.org](http://www.solar-rating.org).
- The Underwriters Laboratory (UL).
- IEEE -929 standard for utility interconnection of PV systems.

#### Technology Specific Criteria

The following equipment qualifications listed are mandatory requirements which must be met at the time of project commissioning to receive a RECPP incentive. The installation guidance is intended to provide consumers with information on installation and operation practices which are most likely to support achieving the system's designed output. Installation guidance is mandated in order for a project to receive a RECPP incentive, as it does reflect both industry and UNS Electric concurrence on those practices

which are important for a technology to best achieve the designed output. In the future, additional installation guidance items may be considered for inclusion as part of the equipment qualifications.

### **Biomass/Biogas, Hydro or Geothermal Electric**

#### Equipment Qualifications

- Biomass/Biogas, Hydro or Geothermal system installations involving a regulated boiler or pressure vessel are required to comply with all Arizona state boiler regulations; provide a qualifying boiler inspection identification number; and keep all applicable permits in good standing.
- System must include a dedicated performance meter to allow for monitoring of the amount of electricity produced.
- Pre-operational/or pre-commissioning energy savings and design output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a qualified registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
- The system will have a material and labor warranty of at least five years.
- The system must meet Arizona DEQ environmental standards.

#### Installation Guidance

Because of the individual nature of biomass/biogas hydro or geothermal systems, care should be taken to make sure the system complies with all applicable permitting and regulatory requirements including, but not limited to, air emission standards and air permit regulations.

### **Biomass/Biogas or Geothermal Space Heating, Process Heating or Space Cooling**

#### Equipment Qualifications

- Biomass/Biogas or geothermal system installations involving a regulated boiler or pressure vessel are required to comply with all Arizona state boiler regulations; provide a qualifying boiler inspection identification number; and keep all applicable permits in good standing.
- Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
- System must include a dedicated performance meter to allow for monitoring of the amount of useful cooling produced. As an exception to the REST Rule R14-2-1803.B, energy production will be calculated at one kW-hr per ton of metered cooling for systems with capacity of 100 tons or less and one kW-hr per 1.33 tons for systems with a capacity of greater than 100 tons.

- Energy production for space heating and process heating will be calculated as one kWh of energy per 3,415 Btu of useful heat delivered by the system and used by the building space or process.
- The system will have a material and labor warranty of at least five years.
- The system must meet Arizona DEQ environmental standards.

#### Installation Guidance

Because of the individual nature of biomass/biogas or geothermal systems, care should be taken to make sure the system complies with all applicable permitting and regulatory requirements including, but not limited to air emission standards and air permit regulations.

### **Solar Non-residential Daylighting**

#### Equipment Qualifications

All systems shall include the following components as part of the daylighting system:

- A roof mounted skylight assembly with a dome having a minimum 70% solar transmittance.
- A reflective light well to the interior ceiling or a minimum 12" below roof deck in open bay areas.
- An interior diffusion lens.
- A minimum of one thermal break/dead air space in the system between the skylight dome and the interior diffuser.
- If artificial lighting systems remain a part of the installation, the system shall include automated lighting control(s) which are programmed to keep electric lights off during daylight hours of sufficient solar insolation to provide minimum design illumination levels.
- The system must provide a minimum of 70% of the light output of the artificial lighting system which would otherwise be used for all of the claimed period of energy savings as measured in foot-candles in the workspace 36 inches above the floor.
- Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer or accredited AEE Measurement and Verification professional. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
- The system will have a material and labor warranty of at least five years.

#### Installation Guidance

All systems should be installed such that the skylight dome is substantially unshaded and have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.

### **Small Wind Generator**

A small wind generator is a system with a nameplate capacity rating of one MW or less. The technology criteria described below are intended for small wind generators with a nameplate rating of 100 kW or less.

Larger systems will be required to submit a detailed package describing site selection, energy production modeling, and an engineered system design and installation report.

### Equipment Qualifications

- Eligible small wind systems must be certified and nameplate rated by the CEC<sup>1</sup>. See [www.consumerenergycenter.org/erprebate/equipment.html](http://www.consumerenergycenter.org/erprebate/equipment.html) for a list of certified generators. For grid tied or off-grid wind generators where an inverter is used, the CEC listed nameplate rating of the wind generator will be multiplied by the CEC approved weighted efficiency percentage listed for the inverter in the "List of Eligible Inverters" at [www.consumerenergycenter.org/cgi-bin/eligible\\_inverters.cgi](http://www.consumerenergycenter.org/cgi-bin/eligible_inverters.cgi) to calculate the wind turbine nameplate rating for use in determining the UFI payment.
- Grid connected inverters used as part of the system shall carry a UL listing certifying full compliance with Underwriter's Laboratory ("UL")-1741
- A system must include a dedicated performance meter (provided by UNS Electric) installed to allow for measurement of the amount of electricity produced.
- The performance meter and utility disconnect for grid tied systems will be installed in a location readily accessible by UNS Electric during normal business hours.
- Off-grid systems of capacity less than 10 kWac will not be metered. Compliance reporting production will be based on an annual 20% capacity factor.
- The tower used in the installation must be designed by an Arizona registered engineer and must be suitable for use with the wind generator. Tower installation must be designed and supervised by individuals familiar with local geotechnical conditions.
- To receive a UFI, the wind generator and system must be covered by a manufacturer's warranty of at least ten years. Otherwise the system will qualify for a PBI. In all cases the wind system will have a material and labor warrantee of at least five years.

### Installation Guidance

- Location: a wind turbine hub should be at least 20 feet above any surrounding object and at least 28 feet above the ground within a 250-foot radius. Wind generators should be installed in locations with an elevation at or above the general elevation of the surrounding terrain.
- Lot Size: should be one-half acre at minimum. Municipalities and public facilities such as schools and libraries are exempt from the minimum lot size requirements.
- The proposed system for which application is made should be demonstrated by support information to obtain at least a 15% annual capacity factor. The following are readily available methods for helping to demonstrate the potential for a 15% capacity factor, but other methods may be used. The installation location should have a demonstrated average annual wind speed of at least 10 MPH as measured at a height of no more than 50 feet above the ground. Average annual wind speed can be demonstrated by wind speed records from an airport, weather station, or

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<sup>1</sup> UNS Electric recommends review of the SWCC standards for rating small wind generators once they become available for purposes of supplanting the CEC requirement in this Technology Criterion.

university within 20 miles of the proposed wind generator location, or by a 50 meter wind power density classification of Class 2 "Marginal" or higher on the State of Arizona Average Annual Wind Resource Map dated July 16, 2005, or later as published by Sustainable Energy Solutions of Northern Arizona University. Northern Arizona University provides detailed wind resource maps as well as other resource services. For more information contact Northern Arizona University at <http://wind.nau.edu/maps/>.

## **Photovoltaic Systems**

### Equipment Qualifications

#### *All Systems*

- All systems shall be installed with a horizontal tilt angle between 10 degrees and 60 degrees, and an azimuth angle of +/- 100 degrees of due south. Installation configurations for some systems receiving a UFI will not be eligible for the full RECPP incentive. The reduction will be determined by the UNS Electric developed de-rating chart, Attachment B of this document, and as discussed further in this report under the section titled Conforming Project Incentives.
- A system must include a dedicated performance meter (on grid tied systems, supplied by UNS Electric) to allow for monitoring of the amount of electricity produced.
- Qualifying systems using Building Integrated Photovoltaic (BIPV) modules of total array capacity of 5 kWdc or less shall receive 90% of the UFI incentive value for PV systems listed in Attachment A. Systems using BIPV module of total array capacity of greater than 5 kWDC shall only receive a PBI.
- Photovoltaic modules must be covered by a manufacturer's warranty of at least 20 years.
- Inverters must be covered by a manufacturer's warranty of at least ten years to receive a UFI and at least five years to receive a PBI.

#### *Grid-Connected Systems*

- The minimum PV array size shall be no less than 1,200 Wdc
- All photovoltaic modules must be certified by a nationally recognized testing laboratory as meeting the requirements of UL Standard 1703.
- All other electrical components must be UL listed.
- The inverter must be certified as meeting the requirements of IEEE-1547 - Recommended Practice for Utility Interface of Photovoltaic Systems and it must be UL 1741 certified.
- The utility meter, inverter, and utility disconnect will be installed in a location readily accessible by UNS Electric during normal business hours.
- Systems shall meet the requirements of Attachment A or Attachment C as appropriate.

### *Off-Grid Systems*

- The minimum PV array size shall be no less than 600 Wdc and the maximum PV array size shall not exceed 2,000 Wdc.
- All photovoltaic modules must be certified by a nationally recognized testing laboratory as meeting the requirements of UL 1703.
- Off-grid systems will not be metered. Compliance reporting production will be based on an annual 20% capacity factor using nameplate DC rating for capacity.
- All other electrical components must be UL listed.

### Installation Guidance

The Customer will be directed to the following resources to gain information regarding industry reference documents for system installation and performance forecasting:

The California Energy Commission's Guide to Buying a Photovoltaic Solar Electric System at [http://energy.ca.gov/reports/2003-03-11\\_500-03-014F.PDF](http://energy.ca.gov/reports/2003-03-11_500-03-014F.PDF)

The Arizona Consumers Guide to Buying a Solar Electric System at [www.azsolarcenter.com/design/azguide-1.pdf](http://www.azsolarcenter.com/design/azguide-1.pdf)

### **Solar Space Cooling**

#### Equipment Qualifications

- The minimum cooling capacity of the system will be 120,000 BTU (10 tons) per hour.
- Solar collector panels used will have a Solar Rating and Certification Corporation ("SRCC") OG-100 rating or laboratory documentation showing the panel energy output under controlled and replicable test conditions.
- Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
- System must include a dedicated performance meter to allow for monitoring of the amount of useful cooling produced. As an exception to the REST Rule R14-2-1803.B, energy production will be calculated at one kW-hr per ton of metered cooling for systems with capacity of 100 tons or less and one kW-hr per 1.33 tons for systems with a capacity of greater than 100 tons.
- The system will have a material and labor warranty of at least five years.



### Installation Guidance

- The horizontal tilt angle of the collector panels should be between 20 and 60 degrees and an azimuth angle should be between +/- 45 degrees of south.
- All systems should be installed such that the energy collection system is substantially unshaded and should have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.
- The system installation should comply with the design manual.

## **Non-residential Solar Water Heating and Space Heating**

### Equipment Qualifications

- Solar collector panels used will have a SRCC OG-100 certification or laboratory documentation showing the panel energy output under controlled and replicable test conditions.
- If annual energy production is expected to exceed 10,000 kWh or equivalent, the system must include a dedicated performance customer supplied meter to allow for monitoring of the amount of useful heat produced. Otherwise, compliance reporting production will be based on the design energy savings submitted at time of application.
- Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
- The solar collector, heat exchangers and storage elements shall have an equipment warranty of at least 10 years to qualify for a UFI and at least five years to qualify for a PBI
- The system will in all cases have a material and full labor warranty of at least five years.

### Installation Guidance

- The horizontal tilt angle of the collector panels should be between 20 and 60 degrees (30 and 60 degrees for space heating applications) and an azimuth angle +/- 45 degrees of south.
- All systems should be installed such that the energy collection system is substantially unshaded and should have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.
- The system installation should comply with the design manual.

## Small Domestic Solar Water Heating and Space Heating

### Equipment Qualifications

- Domestic Solar Water Heating systems will be rated by the SRCC and meet the OG-300 system standard. Systems that include OG-100 collectors, but are not certified under OG-300, will need to be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer detailing annual energy savings. Solar Space Heating systems will utilize OG-100 collectors.
- Domestic Water Heating systems shall be selected and sized according to the geographic location and hot water needs of the specific application. Reservation requests will include a manufacturer's verification disclosing that the system size and collector type proposed is appropriate for the specific application, including certification that collector stagnation temperature shall never exceed 300 degrees Fahrenheit under any possible conditions at the location of the installation. The manufacturer's verification may be presented as a manufacturer's product specification sheet and will be included in the reservation request. Compliance reporting production will be based on the design energy savings submitted at time of application
- Solar Space Heating systems will be sized in conformance with the Solar Space Heating Incentive Calculation Procedure (Attachment E.) Compliance reporting production will be based on the design energy savings submitted at time of application
- Active, open-loop systems are not eligible for RECPP incentives except for active, open-loop systems that have a proven technology or design that limits scaling and internal corrosion of system piping, and includes appropriate automatic methods for freeze protection and prevents stagnations temperatures that exceed 250 degrees F. under all conditions at the location of installation. Details disclosing conformance with this exception shall be submitted as part of the manufacturer's verification documentation.
- Integrated Collector System (ICS) systems shall have a minimum collector piping wall thickness of 0.058 inches. Details disclosing conformance with this requirement shall be submitted as part of the manufacturer's verification documentation. ICS units shall include certification that collector stagnation temperature shall never exceed 250 degrees F. under any possible conditions at the location of the installation.
- The 'high' limit on all Domestic Water Heating controllers shall be set no higher than 160 degrees F.
- Active thermal storage for solar space heating systems shall use water as the storage element.
- Contractors must provide a minimum of a five year equipment warranty as provided by the system manufacturer, including a minimum warranty period of five years for repair/replacement service to the customer.
- Domestic Water Heating systems that are installed as an addition to an existing system or are submitted as a customer designed system or not certified to OG-300 must be specifically reviewed and approved by the utility
- The solar collector, heat exchangers and storage elements shall have an equipment warranty of at least 10 years to qualify for a UFI and at least five years to qualify for a PBI

## Installation Guidance

- The system shall be installed with a horizontal tilt angle between 20 degrees and 60 degrees (40 and 60 degrees for space heating applications), and an azimuth angle of +/- 60 degrees of due south (+/- 20 degrees for space heating applications). It is recommended that collectors be positioned for optimum winter heating conditions at a minimum tilt angle of 45 degrees above horizontal, or as recommended by the manufacturer for the specific collector type and geographic location of installation.
- All systems should be installed such that the energy collection system is substantially unshaded and should have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.
- Heat exchange fluid in glycol systems should be tested, flushed and refilled with new fluid as necessary or at a minimum every five years or sooner per manufacturer's recommendations.
- It is recommended that the anode rod be checked and replaced per manufacturer's recommendations, but no less frequently than every five years.
- It is recommended that the system design include a timer, switch, or other control device on the backup element of the storage tank.
- The collectors and storage tank should be in close proximity to the backup system and house distribution system to avoid excessive pressure or temperature losses.
- It is recommended that in areas where water quality problems are reported to have reduced the expected life of a solar water heater, that a water quality test is performed for each residence to screen for materials that through interaction with the materials of the proposed solar water heating system may reduce the expected operational life of the system components. The customer should consider contacting the manufacturer to determine if warranty or operational life will be affected.
- In areas subject to snow accumulation, sufficient clearance will be provided to allow a 12" snowfall to be shed from a solar collector without shadowing any part of the collector.
- Each system shall have a comprehensive operation and maintenance manual at the customer's site, which includes a spare parts list, data sheets and flow diagrams indicating operating temperatures and pressures, maintenance schedules and description of testing methods and each customer must complete an initial start up and operation training review with the contractor at the time of system start up.
- Ball valves shall be used throughout the system. Gate valves shall not be used.
- Pipes carrying heated fluids shall be insulated for thermal energy conservation as well as personnel protection.

## **Technologies without Technology Specific Criteria and Non-Conforming Projects**

Technology specific criteria have not yet been developed for the following qualifying technologies:

- Fuel Cells
- Non-Residential Pool Heating

For applicants requesting incentives for the above technologies or for applicants requesting installation of a technology with conforming project technology criteria, but where some criteria cannot be met, the applicant will need to submit design and output documentation.

Applicants installing these systems will, at a minimum, need to provide an energy savings and designed output report for the system. The report must include either a testing certification for a substantially similar system prepared by a publicly funded laboratory or an engineering report stamped by a qualified registered professional engineer. The engineering report and/or testing certification shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications. Additional information may be required as part of the RECPP requirements.

## **Distributed Renewable Energy Resource Incentives**

### Incentive Principles

RECPP incentives can be applied to systems designed to serve only the typical load of the customer with whom the incentive agreement has been established. The assessment of that typical load does not preclude the periodic production of electricity in excess of the customer's demand. Under some circumstances it is understood that select customer installations will be designed to serve loads greater than that of the customer. Under those circumstances, the RECPP incentive will be applied only to the fraction of the generation which is used to serve the typical customer load. Other incentives were developed separate and apart from other RECPP program incentives, such as those for demand side management projects. Systems are not eligible to receive RECPP incentives if other utility incentives are applied.

Up-front incentives (UFIs) are those incentives where the customer receives a one-time payment based on the system's designed capacity or based on the first year energy savings provided by the system. In general, this type of incentive is appropriate for smaller, 20 kWac or less, non-residential installations and all residential installations. The second incentive type is a production based incentive (PBI). The PBI allows the customer to collect incentive payments in direct relation to the actual system production. PBIs are most appropriate where the total system costs are large, of 20 kWac capacity or above.

Incentive funds can be applied to a project, which is the sum of all systems installed at a customer site in a single calendar year. A customer site is the sum of facilities and/or buildings associated with a single utility revenue meter.

A customer site can obtain a UFI for multiple projects, under separate reservations, up to 20,000 Wac capacity equivalent at each customer site. Once the sum of incentives for all project(s) exceeds the 20,000 Wac capacity equivalent limit, described below, incentives for additional projects will take the form of a PBI. This condition only applies to non-residential systems. No partial or split payment types are allowed under one project regarding a UFI or PBI.

All residential systems will be offered only a UFI, unless system warranty conditions will not qualify for a UFI in which case a PBI would apply. Residential customers will receive a UFI up to a cap of 20kWac. If a residential system is installed above 20 kWac, UNS Electric will only provide an incentive payment

for the first 20 kWac. Non-residential systems may receive either a UFI or a PBI, depending on the warranty period, technology and the installation size. UFIs were developed for technologies where the average project size results in a total single site renewable capacity equivalent installed less than or equal to 20,000 watts AC. PBIs were developed for technologies where the average project size results in a total single site installed capacity equivalent of more than 20,000 Wac. Both UFIs and PBIs were developed for technologies where projects can range in size. There is no incentive cap for non-residential systems other than annual program funding considerations.

In return for UNS Electric's payment of a UFI, UNS Electric will be given complete and irrevocable ownership of the RECs until December 31<sup>st</sup> of the 20<sup>th</sup> full calendar year after completion of installation of the system. Operational life during that time frame must be supported by system warranty or planned maintenance schedules.

UNS Electric's payment of a PBI will assure UNS Electric complete and irrevocable ownership of the REC for the full duration of the PBI agreement. The agreement duration must fully coincide with the PBI payment schedule and the system must be supported by system warranty or planned maintenance schedules for the term of the agreement.

Projects receiving a UFI can receive no more than 60% of the system cost in the total incentive payout. A PBI can not exceed 60% of the real project costs, defined as the undiscounted total system cost plus acceptable financing charges. Acceptable finance charges are finance charges used for the PBI incentive cap calculation and can not exceed the current prime interest rate plus 5%. Financing charges must be disclosed as part of the commissioning package, if not disclosed before.

It is expected that the UFI and PBI incentive caps as a percentage of system cost will decline in the third year of the program to 55%, and the caps will decline to 50% in the fifth year and beyond.

RECPP incentives in combination with other state and federal incentives make it likely that some renewable energy production systems would be free to the customer, or in the extreme, that the customer would realize a net profit from installing a system.

To prevent this result, UNS Electric requires that customers requesting incentives for these systems be required to contribute a minimum of 15 percent of the System Cost in the case of a UFI and of the Project Cost in the case of a PBI. As such, the incentive for all RECPP projects will be calculated as follows: assume the full application of all available incentives, not including the RECPP incentive, and regardless of the customer's ability to fully realize any particular incentive, add the customer contribution (15%), and finally add the RECPP incentive. If the RECPP incentive can be fully applied given the other incentive cap provisions without exceeding the System Cost in the case of a UFI or Project Cost in the case of a PBI, the customer will receive the full incentive amount. If the RECPP incentive cannot be fully applied without exceeding the System Cost in the case of a UFI or Project Cost in the case of a PBI, the RECPP incentive will be capped such as not to exceed the System Cost in the case of a UFI or the Project Cost in the case of a PBI. The incentive amount will be calculated at the time the application is approved for reservation. If federal or state incentives change during the period of time after the reservation approval, the incentive amount reserved will not be changed as long as the reservation is not cancelled.

### Conforming Project Incentives

Conforming project incentives were developed to help create or expand incipient markets for distributed renewable energy production facilities, taking into account each technology's specific market conditions, and placing a significant portion of the cost on project owners. The incentives reflect specific input from each technology representative(s). Program incentives were generally not developed with specific consideration for other available state or federal incentives. Incentive caps detailed above were relied upon to account for the impact of multiple incentive sources.

In general, PBI incentive levels were developed first by establishing an incentive for a 10-year agreement. The incentives proposed by UNS Electric are detailed in Attachment D. UNS Electric proposes that the incentive matrix in Attachment D be applied for the first five years of the RECPP. In all cases, incentive values listed in Attachment D are maximum values. Applicants are encouraged to submit applications requesting incentive amounts less than the maximums listed. Applications requesting a lower level of incentive payment than the maximum will have an increased chance of acceptance in the allocation ranking process.

UNS Electric proposes that incentive types should transition to all PBI based incentives after 2012 and incentive levels should continue to decline in future program years. In the long term, incentives should be market based. UNS Electric also recommends that the declining incentives and proposed reductions be carefully reviewed prior to implementation.

### Technologies with Special Incentive Considerations

Beyond the requirements of the technology specific criteria and the requirements of the incentive matrix, some technologies require additional project specific adjustment of the available incentives. Those specific requirements are detailed below.

#### **Photovoltaic Systems**

The productivity of photovoltaic systems is sensitive to the specifics of the installation method and location. In particular, these systems are impacted by shading, photovoltaic panel horizontal tilt angle and azimuth, and potentially regional conditions. These factors are particularly important as they relate to systems receiving UFI type incentives both in the amount of incentive received by the customer and in the computation of the capacity reported by UNS Electric.

UNS Electric has established a single incentive adjustment table clearly detailing adjustments for each allowable photovoltaic system configuration. UNS Electric will work to assure that the adjustment table is easily interpreted by consumers and installers. The incentive adjustment chart prepared by UNS Electric is included as Attachment B.

#### **Small Domestic Solar Hot Water and Space Heating Systems**

Accurately predicting appropriate incentive levels in support of system costs associated with small domestic solar hot water and space heating systems present a challenge. RECPP incentives in combination with other state and federal incentives make it likely that some systems would be free to the customer, or in the extreme, that the customer would realize a net profit from installing a system.

To prevent this result, UNS Electric proposes that customers requesting incentives for these systems be required to contribute a minimum of 15 percent of the system cost. As such, the incentive for small domestic solar hot water and space heating systems will be calculated as follows: assume the full application of all available incentives, not including the RECPP incentive, and regardless of the customer's ability to fully realize any particular incentive, add the customer contribution (15%), and finally add the RECPP incentive. If the RECPP incentive can be fully applied without exceeding the System Cost, the customer will receive the full incentive amount. If the RECPP incentive cannot be fully applied without exceeding the System Cost, the RECPP incentive will be capped such as not to exceed the System Cost.

Example:

$$\text{RECPP Incentive} \leq (\text{System Cost}) - (\text{Total of all Incentives})$$

Where:

$$\text{Total of all Incentives} = \text{Federal Incentives} + \text{State Incentives} + (15\% \text{ Customer Contribution})$$

For purpose of UFI calculation, System Cost for a solar space heating system will not include the cost of any passive thermal storage or the cost of the building heating system itself. It will include the cost of new materials and installation of active thermal storage, expansion tanks, controls, tempering valves, piping, vents, drains, safety valves and all freeze protection.

### **Small Solar Space Heating System**

There are several additional challenges associated with Solar Space Heating Systems. Variability in design for these systems generally suggested a high level of expertise was required to appropriately size and design the systems; yet the overall system cost seemed to require a standardized approach. In order to address this challenge, UNS Electric has adopted a standardized calculation method to support system sizing and incentive payment. The display page of the spreadsheet calculation is presented in Attachment E.

The solar space heating incentive calculation does not suggest or imply that a full energy audit is required to qualify for the solar space heating incentive. The intent is that industry professionals can utilize the calculation tool to aid in facilitating sound system design.

The effective use of the solar space heating incentive calculation is contingent on a Building Design Review. The Building Design Review calculations, inputs and outputs will be determined and specified as part of the reservation request. It is noted that stakeholder acceptance of the proposed calculation tool is conditioned on the future development of standardized design tools, potentially including input tables and charts.

UNS Electric believes that the proposed approach reflects sound design principles and uses inputs which should be available to professionals in this industry segment. UNS Electric does, however, recognize that the approach used in the standardized calculation is not currently universally applied. UNS Electric proposes that continuing efforts be made to develop standard input charts and tables to increase the

efficiency of the method's application. In addition, it is the expectation of UNS Electric that the standard calculation can, in most instances, be implemented by practitioners in the solar space heating industry. UNS Electric supports industry collaborative efforts to increase technical knowledge development in this specific area.

### **RECPP Incentive Allocation**

UNS Electric identified two primary program level allocations in conjunction with the RECPP. The first allocation is that associated with RECPP conforming projects. The second is that associated with RECPP non-conforming Projects.

#### Conforming Project Incentive Allocation

Beyond the allocation made by UNS Electric for purposes of funding conforming projects, UNS Electric also recommends an allocation framework within the conforming project allocation. UNS Electric designed the allocation framework with several key considerations in mind. The factors considered in developing project incentive allocations were as follows:

- Administrative ease
- Economic efficiency
- Consumer clarity and ease of understanding
- Establishment of a high degree of market certainty
- Encouragement of cost reductions in renewable energy technologies
- Flexibility sufficient to allow timely adaptations to changing market conditions
- Capability for making funds available in a timely manner, and
- Avoidance of excessive incentives

These considerations resulted in two different allocation frameworks, one for residential projects and one for non-residential projects. The allocation frameworks are described below.

#### Conforming Projects – Residential Incentive Allocation – 85% of Distributed Generation funds in 2008.

Funds for conforming residential projects will be divided into four quarters (Jan-Mar, Apr-Jun, Jul-Sep, and Oct-Dec). Funds within each quarter will be made available weekly for reservations on a first-come, first-served basis. However, applications received during a given week that request incentive funding levels below the maximum incentive values will receive priority for the allocation of funds available that week based on the lowest expected life cycle credit purchase cost as provided in the application and verified by UNS Electric. Reservation requests can be made throughout each quarter and will be reviewed and approved by the utility weekly as long as the quarterly funding has not been exhausted, assuming all other program requirements have been met.

Funds unused in one quarter will be equally divided among the remaining quarters in that year. Funds allocated to residential projects will not roll forward from one year to the next. If funds in one quarter are



fully exhausted, funds for the following quarter will be made available at the start of the following quarter.

Reservations which are rejected as a result of insufficient funds will be offered the opportunity to retain their original reservation date for one additional quarter without the need to resubmit application documentation. If the incentive level has changed from the date of the original reservation to the date when the reservation is approved, the new incentive level shall be applied.

Conforming Projects – Non-residential Incentive Allocation – 15% of Distributed Generation Funds in 2008.

The non-residential incentive allocation framework allows market forces to play a major deciding role in the selection of projects when the volume of proposed projects exceeds the budget for non-residential projects. When the volume of proposed projects is relatively small so that the non-residential program is not fully subscribed, all conforming projects would be selected. In addition, a yearly review will be made to observe and review trends in requested and approved incentive levels. UNS Electric believes this element is important for the on-going management and potential adjustment of incentive levels as needed to respond to market conditions.

Non-residential funds will be equally divided into four quarters (Jan-Mar, Apr-Jun, Jul-Sep, and Oct-Dec). Funds within each period will be made available to projects based on a ranking generated by lowest expected life cycle credit purchase cost as provided in the application and verified by UNS Electric. In the event of a tie in the ranking, when the program would be fully subscribed if both projects were given reservation status, funds will be awarded based on the date of receipt of the completed reservation request.

In each three-month period, reservation requests will be accepted, but they will be reviewed by the utility only after the conclusion of the three month period. Once reservation requests are fully ranked in each reservation period, notification of reservation approvals and rejections will be made in conformance with the rankings and available funding.

Funds unused in one period will be equally divided among the remaining periods in that year. Funds allocated to non-residential projects will not roll forward from one year to the next. Reservations which are rejected as a result of insufficient program funds may elect to carry forward into the next period and retain the original reservation date. The election must be made at the time of the original application.

Within each period, projects submitted to the utility for reservation will be ranked based on a calculated index value for purposes of allocating non-residential funds as proposed in the application and verified by UNS Electric. Lowest lifecycle cost projects will be funded first. Indexing of the non-residential projects will be performed based on the verified incentive values and terms in the application for that project. Projects with higher incentive payments result in a higher expected life cycle credit purchase cost and projects that produce more kWh result in a lower expected life cycle credit purchase cost.

## **Conforming Projects Fund Contributions Between Residential and Non Residential**

Available funding will be split between residential and non-residential project classes. Initially 15% is being allocated to non residential system incentives and 85% is being allocated to residential system incentives. This split will be reapplied each quarter if all funds are not reserved.

### **Non-Conforming Projects – Allocation: 0% of Distributed Generation Funds in 2008.**

Non-conforming projects include, but are not limited to, projects with staged completion dates, multi-customer or multi-system projects, projects involving more than one technology where an interrelated incentive was not developed, projects requiring new or unique agreement terms, or projects requiring timelines differing from those offered to conforming projects. Non-conforming projects also include technologies for which a conforming incentive or technical qualifications were not developed at the time of this plan.

As detailed in the RECPP incentive allocation section of this plan, UNS Electric will disclose the allocation of funds for non-conforming projects in its implementation plan for the next year. UNS Electric will generally, but not always, include a minimum allocation to allow for the potential development of projects with technologies not included on the conforming project incentive matrix.

UNS Electric will apply a minimum of 50% and a maximum of 75% of the non-reserved, non-conforming project allocation to conforming project funding at the end of each calendar quarter. Unreserved non-conforming project allocations will not carry forward from one year to the next.

Incentives used for non-conforming projects must achieve similar economic efficiency as those incentives used in the conforming project category. Incentives applied for non-conforming projects must meet the lower of: 1) the maximum allowable incentive for the proposed technology as described in Attachment D, or 2) the average incentive value of projects accepted by UNS Electric for incentive disbursement for the proposed technology in the previous year.

Some qualifying technologies will not meet either of the previously described economic efficiency measures. Those applicants can negotiate the requested system or project incentive with UNS Electric. In no instance can the incentive exceed the highest calculated appropriate incentive payment value for projects approved by UNS Electric in the previous year.

Under some circumstances a non-conforming project may not identify the customer at project initiation. Regardless of the project design, implementation, or timeline, a customer must be identified at the time of system commissioning. Non-conforming funds will be disbursed upon filing by the customer and acceptance of project commissioning documentation by UNS Electric. For purposes of financing non-conforming projects, funds can be assigned to third parties.

Non-conforming systems must report system capacity (for up-front incentives) or production (for performance-based incentives) in general conformance with those same technologies as described in the conforming project requirements and be covered by similar warranties. For those technologies not described in the conforming project criteria, the reservation documentation must include details related to

warranty, system capacity and anticipated annual production. Metering equipment must be made available to UNS Electric during normal business hours for inspection and reporting purposes.

Initially, no funding would be allocated to the Non-Conforming Project class. However, if Non-Conforming Project applications are received, unused funds from the Conforming Project Classes may be allocated to the Non-Conforming Project class. Alternatively, if sufficient interest in developing Non-Conforming Projects is demonstrated, they could be accepted into the Conforming Project class after development and acceptance of technical standards and appropriate incentive values; or UNS Electric could request a special project fund allocation for a specific Non-Conforming Project in its annual REST Tariff Adjustor Mechanism and Implementation Plan filing.

Application Process  
**ATTACHMENT A**

**System Qualifications**

All solar electric generating Customer Systems must meet the following system and installation requirements to qualify for Tucson Electric Power Company's ("UNS Electric" or the "Company") GreenWatts™ SunShare Hardware Buydown Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Hardware Buydown Agreement.

1. A Residential Customer System must have a total solar array nameplate rating of at least 1,200 watts DC and no more than 30,000 watts DC. Any Non-Residential Customer System must have a total solar array nameplate rating of more than 1,200 watts DC.
2. The Customer System components must be certified as meeting the requirements of IEEE-929 - Recommended Practice for Utility Interface of Photovoltaic Systems.
3. The Customer System components must be certified as meeting the requirements of UL-1741 - Power Conditioning Units for use in Residential Photovoltaic Power and be covered by a non-prorated manufacturer's warranty of at least two years.
4. Photovoltaic components must be certified as meeting the requirements of UL-1703 - Standard for Flat Plate Photovoltaic Modules and Panels Systems and be covered by a non-prorated manufacturer's warranty of at least 20 years.
5. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code, including Article 690 and all grounding, conductor, raceway, over-current protection, disconnect and labeling requirements.
6. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code in effect in the jurisdiction where the installation is being completed (NEC), including, without limitation, Sections 200-6, 210-6, 230-70, 240-3, 250-26, 250-50, 250-122, all of Article 690 pertaining to Solar Photovoltaic Systems, thereof, all as amended and superseded.
7. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
8. The Customer System installation must meet the UNS Electric Service Requirements as follows:  
  
"An AC disconnect means shall be provided in an area accessible at all times to the Company on all ungrounded AC conductors and shall consist of a lockable gang operated disconnect clearly

indicating open or closed. The switch shall be visually inspected to determine that it is open. The switch shall be clearly labeled "DG SERVICE DISCONNECT."

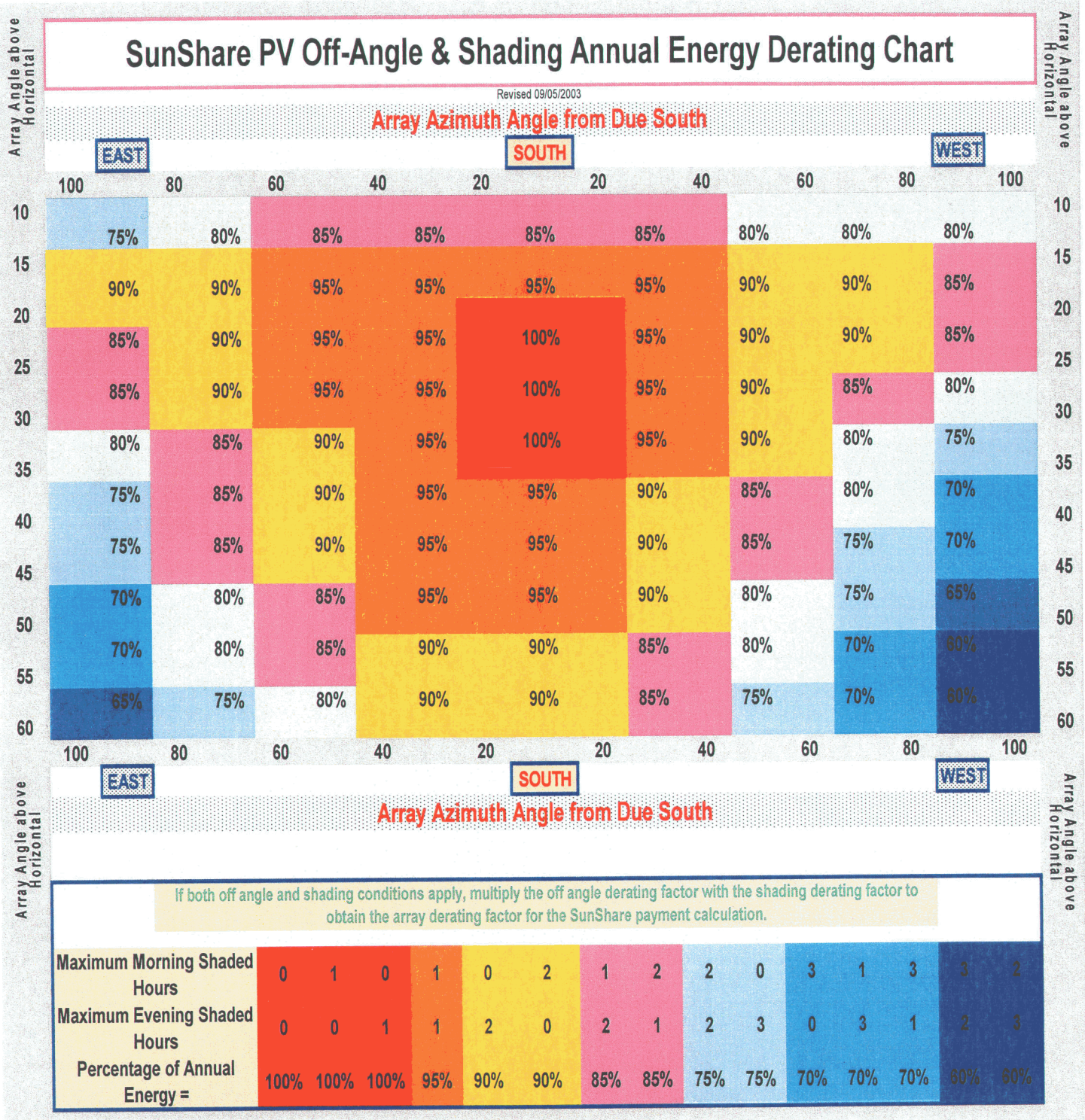
9. The Customer System photovoltaic panels and modules must face within +/- 100 degrees of real south, and be completely unshaded from three hours after sunrise to three hours before sunset. System arrays which are facing at an azimuth angle of more than 20 degrees from true south or shaded for more than one hour per day will be subject to a reduced amount of buydown payment per Attachment B.
10. The Customer System photovoltaic panels and modules must be fitted at an angle of 10 degrees to 60 degrees from horizontal. System arrays which are fitted with an elevation angle of less than 20 degrees or more than 35 degrees above horizontal will be subject to a reduced amount of buydown payment per Attachment B.
11. For Residential Customer Systems, Company will provide a meter and meter socket that will be installed in a readily accessible outdoor location by the Customer between the DC to AC converter and the connection to the over-current device in the Customer's electric service panel. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the DC to AC converter and the connection to the over-current device in the Customer's electric service panel.
12. Storage Batteries are not allowed as part of the Customer System unless the inverter is a separate component and UNS Electric can locate the Solar Meter at the inverter's output. If configured otherwise, battery losses will adversely reflect in the annual AC metered energy output. Customer's solar energy generation and energy storage system must meet the requirements of 2 and 3 of this Attachment A.
13. Installation must have been made after January 1, 1997.
14. The Customer must be connected to the Company's electric grid, except for approved off-grid systems in conformance with the RECPP.
15. The DC to AC inverter used must provide maximum power point tracking for the full voltage and current range expected from the photovoltaic panels used and the temperature and solar insolation conditions expected in Mohave County or Santa Cruz County, Arizona.
16. The DC to AC inverter must be capable of adjusting to "sun splash" from all possible combinations of cloud fringe effects without interruption of electric production.
17. All Customer System installations must be completed in a professional, workmanlike and safe manner.
18. Total voltage drop on the DC and AC wiring from the furthest PV module to the AC meter will not exceed 2%.

19. PV panels and DC to AC inverter will be installed with sufficient clearance to allow for proper ventilation and cooling. At a minimum, manufacturer clearance recommendations will be observed. In no case will PV modules be mounted less than 4 inches above any surface and an additional inch of clearance for each foot of continuous array surface beyond four feet in the direction parallel to the mounting support surface.



# ATTACHMENT B

## SunShare PV Off-Angle & Shading Annual Energy Derating Chart



**ATTACHMENT C**  
**Supplemental Non-Residential System Qualifications**  
**(Applicable Only for Customer Systems of Capacity Larger than 20,000 watts AC)**

1. All solar electric generating Non-Residential Customer Systems must meet the following additional system and installation requirements to qualify for UniSource Electric's ("UNS Electric" or the "Company") GreenWatts™ SunShare Hardware Buydown Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Hardware Buydown Agreement.
2. The Non-Residential Customer System shall be operating, substantially complete and have produced an AC output at least 70% of the total array nameplate DC rating at PTC as described below.
3. Operation, Maintenance and Repair. The Customer shall be solely responsible for the operation, maintenance and repair of the Non-Residential Customer System and any and all costs and expenses associated therewith. Company will notify Customer of all Non-Residential Customer System repairs the Company determines are reasonably necessary to support proper continued electrical production of the Non-Residential Customer System. The Customer will notify the Company within five (5) business days of its receipt of any such Company repair notice if the repair requires the installation of a new inverter and/or PV module. The Customer shall complete any such repair that affects the Non-Residential Customer System performance and does not require the purchase of a new inverter or PV module(s) within five (5) business days of the Company's notice of the need for such repair. For any such repair that does require the purchase and installation of a new inverter and/or PV module, the Customer shall promptly commence and diligently pursue such repair to completion, provided, in no event shall such repair take more than thirty (30) days to complete. At all times while Company is receiving the environmental credits from the Non-Residential Customer System, Customer shall clean all PV modules in the Non-Residential Customer System as necessary to keep them free from foreign material that would visibly obscure the modules, including any dirt and/or oils.
4. Non-Residential Customer System Security. At all times during and after installation of the Non-Residential Customer System, the Customer shall use commercially reasonable efforts to provide adequate security to prevent damage or vandalism to the Non-Residential Customer System.
5. Company shall provide Customer with a revenue grade AC meter to be installed between the Non-Residential Customer System and the grid interconnection. This meter will not be used for billing, but shall be used for any official Non-Residential Customer System production output data. Company will retain ownership of the meter and be responsible for its repair if needed.
6. The utility interactive solar generation Non-Residential Customer System shall deliver an AC output in AC watts at least equal to 70% of the total array nameplate rating in DC watts as measured at performance test conditions (PTC) of 1000 watts/m<sup>2</sup> irradiance, 68 degrees F. ambient temperature and a maximum of a 2.4 mph wind speed. The Customer will verify performance of



the system with a 30 day test using a temporary data monitor and acquisition system or make a single point measurement to determine the output of the system.

7. The Customer shall verify and demonstrate to Company the proper calibration and operation, through a temporary data monitor and acquisition system, of the solar insolation sensor, the ambient temperature sensor, the wind speed sensor and the AC power meter within +/- 2% of Company independent sensor data. If performance test data is not available at PTC, the indicated AC power output of the Non-Residential Customer System will be corrected to PTC by the following formula:

$$\text{Power(PTC)} = ((\text{Power(Meter)} * (1000 / \text{SolarSensor(W/M}^2))) * (1 + (((\text{AmbientTempSensor(DegF)}) - 68) * 0.0026)))$$

(On the condition that data used in the formula is taken on a cloudless day at a solar insolation of at least 950 watts per square meter and wind speed is less than 2.4 mph)

8. Company shall have the right to challenge the accurate calibration of the sensors and temporary data monitor and acquisition system with proper documentation demonstrating the reasons for the challenge. The Customer shall resolve the challenged sensor or temporary data monitor and acquisition system calibration to the satisfaction of Company prior to the data being used in the performance test being recorded.
9. Customer shall provide Company with no less than ten (10) days prior notice of any planned Customer tests to the Non-Residential Customer System. Company shall have the right to be present at any and all tests of the Non-Residential Customer System. The Customer shall provide Company notice as soon as the Non-Residential Customer System has been installed and has passed all Customer tests.
10. Customer shall provide Company with all documentation reasonably requested by Company to demonstrate to the Commission that any environmental credits transferred under the Agreement were derived from an eligible technology, that the kWh generated are accurately reported and that the environmental credits have not expired or been used by any other entity for any purpose.
11. If certified proof can not be provided of complete galvanic isolation of any and all DC from the AC output of the inverter(s) used in the Non-Residential Customer System through IEEE-1547 certification of the inverter, the Non-Residential Customer System shall include an isolation transformer installed between the inverter(s) and the grid interconnection. The transformer will be rated at full load continuous operation at 50 degrees C. at 125% of nameplate DC array rating and have an efficiency rating at nameplate DC array rating power of at least 98% as tested. The transformer will have at least one tap each of 2.5% and 5% both above and below the nominal voltage tap.

## ATTACHMENT D

### RECPP – CONFORMING PROJECT INCENTIVE MATRIX

2008 and 2009 Program Year

Technology/Application	UP FRONT INCENTIVE <sup>1</sup>	10-Year REC Agreement <sup>2</sup>	15-Year REC Agreement <sup>2</sup>	20-Year REC Agreement <sup>2</sup>
	20-Year REC Agreement	10-Year Payment (\$/kWH)	15-Year Payment (\$/kWH)	20-Year Payment (\$/kWH)
BIOMASS/BIOGAS (Electric)	NA	0.060	0.056	0.054
BIOMASS/BIOGAS – CHP (Electric) <sup>3</sup>	NA	0.035	0.032	0.031
BIOMASS/BIOGAS – CHP (Thermal) <sup>3</sup>		0.018	0.017	0.016
BIOMASS/BIOGAS (thermal)	NA	0.015	0.014	0.013
BIOMASS/BIOGAS (cooling)	NA	0.032	0.030	0.029
DAYLIGHTING (Non-Residential)	\$0.20/kWH <sup>7</sup> See this note for clarification	NA	NA	NA
GEOHERMAL – (electric)	NA	0.024	0.022	0.022
GEOHERMAL – (thermal)	1.00/Watt	0.048	0.045	0.043
GEOHERMAL – (cooling)	NA	0.032	0.030	0.029
SMALL HYDRO	NA	0.060	0.056	0.054
SMALL WIND (grid-tied) <sup>4</sup>	\$2.50/Watt AC	0.145	0.135	0.130
SMALL WIND (off-grid) <sup>4</sup>	\$2.00/Watt AC	0.116	0.108	0.104
SOLAR ELECTRIC:				
RESIDENTIAL (GRID-TIED)	\$3.00/Watt DC <sup>8</sup>	0.202	0.187	0.180
Non-Residential (Grid-Tied) 20 kW or less	\$2.50/Watt DC <sup>8</sup>	0.202	0.187	0.180
NON-RESIDENTIAL (GRID-TIED) More than 20 kW	NA	0.202	0.187	0.180
RESIDENTIAL (OFF-GRID)	\$2.00/Watt DC <sup>8</sup>	NA	NA	NA
NON-RESIDENTIAL (OFF-GRID)	NA	0.121	0.112	0.108
SOLAR SPACE COOLING <sup>5</sup>	NA	0.129	0.120	0.115
SOLAR WATER HEATING/SPACE HEATING <sup>5</sup> (Non-Residential)	NA	0.057	0.052	0.051
RESIDENTIAL SOLAR WATER/SPACE HEATING <sup>6</sup>	\$750.00 plus \$0.25/kWH to a maximum of \$1,750.00 <sup>9, 10</sup>	0.057	0.052	0.051
NON-RESIDENTIAL POOL HEATING	NA	0.012	0.011	0.011



## RECPP – CONFORMING PROJECT INCENTIVE MATRIX

2010 and 2011 Program Year

Technology/Application	UP FRONT INCENTIVE <sup>1</sup> 20-Year REC Agreement	10-Year REC Agreement <sup>2</sup> 10-Year Payment (\$/kWH)	15-Year REC Agreement <sup>2</sup> 15-Year Payment (\$/kWH)	20-Year REC Agreement <sup>2</sup> 20-Year Payment (\$/kWH)
BIOMASS/BIOGAS (Electric)	NA	0.054	0.050	0.048
BIOMASS/BIOGAS – CHP (Electric) <sup>3</sup>	NA	0.032	0.029	0.028
BIOMASS/BIOGAS – CHP (Thermal) <sup>3</sup>		0.016	0.015	0.014
BIOMASS/BIOGAS (thermal)	NA	0.014	0.013	0.012
BIOMASS/BIOGAS (cooling)	NA	0.029	0.027	0.026
DAYLIGHTING (Non-Residential)	\$0.18/kWH <sup>7</sup> See this note for clarification	NA	NA	NA
GEOTHERMAL – (electric)	NA	0.022	0.020	0.019
GEOTHERMAL – (thermal)	0.90/Watt	0.044	0.040	0.039
GEOTHERMAL – (cooling)	NA	0.029	0.027	0.026
SMALL HYDRO	NA	0.054	0.050	0.048
SMALL WIND (grid-tied) <sup>4</sup>	\$2.25/Watt AC	0.131	0.121	0.117
SMALL WIND (off-grid) <sup>4</sup>	\$1.80/Watt AC	0.105	0.097	0.094
SOLAR ELECTRIC:				
RESIDENTIAL (GRID-TIED)	\$3.00/Watt DC <sup>8</sup>	0.182	0.168	0.162
Non-Residential (Grid-Tied) 20 kW or less	\$2.25/Watt DC <sup>8</sup>	0.182	0.168	0.162
NON-RESIDENTIAL (GRID-TIED) More than 20 kW	NA	0.182	0.168	0.162
RESIDENTIAL (OFF-GRID)	\$1.80/Watt DC <sup>8</sup>	NA	NA	NA
NON-RESIDENTIAL (OFF-GRID)	NA	0.109	0.101	0.097
SOLAR SPACE COOLING <sup>5</sup>	NA	0.116	0.108	0.104
SOLAR WATER HEATING/SPACE HEATING <sup>5</sup> (Non-Residential)	NA	0.051	0.047	0.045
RESIDENTIAL SOLAR WATER/SPACE HEATING <sup>6</sup>	\$750.00 plus \$0.25/kWH to a maximum of \$1,750.00 <sup>9, 10</sup>	0.051	0.047	0.045
NON-RESIDENTIAL POOL HEATING	NA	0.011	0.010	0.010



## RECPP – CONFORMING PROJECT INCENTIVE MATRIX

2012 Program Year

Technology/Application	UP FRONT INCENTIVE <sup>1</sup> 20-Year REC Agreement	10-Year REC Agreement <sup>2</sup> 10-Year Payment (\$/kWH)	15-Year REC Agreement <sup>2</sup> 15-Year Payment (\$/kWH)	20-Year REC Agreement <sup>2</sup> 20-Year Payment (\$/kWH)
BIOMASS/BIOGAS (Electric)	NA	0.046	0.043	0.041
BIOMASS/BIOGAS – CHP (Electric) <sup>3</sup>	NA	0.027	0.025	0.024
BIOMASS/BIOGAS – CHP (Thermal) <sup>3</sup>		0.014	0.013	0.012
BIOMASS/BIOGAS (thermal)	NA	0.011	0.011	0.010
BIOMASS/BIOGAS (cooling)	NA	0.025	0.023	0.022
DAYLIGHTING (Non-Residential)	\$0.15/kWH <sup>7</sup> See this note for clarification	NA	NA	NA
GEOHERMAL – (electric)	NA	0.019	0.017	0.017
GEOHERMAL – (thermal)	0.77/Watt	0.037	0.034	0.033
GEOHERMAL – (cooling)	NA	0.025	0.023	0.022
SMALL HYDRO	NA	0.046	0.043	0.041
SMALL WIND (grid-tied) <sup>4</sup>	\$1.91/Watt AC	0.111	0.103	0.099
SMALL WIND (off-grid) <sup>4</sup>	\$1.53/Watt AC	0.089	0.082	0.080
SOLAR ELECTRIC:				
RESIDENTIAL (GRID-TIED)	\$3.00/Watt DC <sup>8</sup>	0.154	0.143	0.138
Non-Residential (Grid-Tied) 20 kW or less	\$1.91/Watt DC <sup>8</sup>	0.154	0.143	0.138
NON-RESIDENTIAL (GRID-TIED) More than 20 kW	NA	0.154	0.143	0.138
RESIDENTIAL (OFF-GRID)	\$1.53/Watt DC <sup>8</sup>	NA	NA	NA
NON-RESIDENTIAL (OFF-GRID)	NA	0.093	0.086	0.083
SOLAR SPACE COOLING <sup>5</sup>	NA	0.099	0.092	0.088
SOLAR WATER HEATING/SPACE HEATING <sup>5</sup> (Non-Residential)	NA	0.043	0.040	0.039
RESIDENTIAL SOLAR WATER/SPACE HEATING <sup>6</sup>	\$750.00 plus \$0.25/kWH to a maximum of \$1,750.00 <sup>9, 10</sup>	0.043	0.040	0.039
NON-RESIDENTIAL POOL HEATING	NA	0.009	0.009	0.008

Notes:

- 1) Residential projects are eligible for an up front incentive (UFI). UFI payments can not exceed 60% of the cost of renewable energy equipment.
- 2) Non-residential under 20 kW is preferably UFI but can be a PBI. Non-residential 20 kW and greater is PBI only. The total of payments under a production based incentive can not exceed 60% of the project costs for any project.
- 3) The CHP incentives may be used in combination for the appropriate components of one system.
- 4) This PBI applies to a maximum system size of 100 kW. Larger wind systems may apply for incentives as NCP.
- 5) The solar space heating and cooling incentives may be used in combination for the appropriate components of one system.
- 6) This category includes both traditional water heating and those systems combined with residential solar water heating used for space heating. Space heating applications require a report detailing energy saving for the complete system.
- 7) Rate applies to measured first five years of energy savings only. Payments are made over a five year period.
- 8) Some installations will require an adjustment of the incentive as detailed in the PV Incentive Adjustment Chart.
- 9) Energy savings rating is based on the SRCC OG-300 published rating or the UNS Electric-RECPP Space Heating Calculator. The customer contribution must be a minimum of 15% of the project cost after accounting for and applying all available Federal and State incentives.
- 10) Rate applies to forecast/measured first year energy savings only.  
NA – Not Available

# ATTACHMENT E

## Solar Space Heating UFI Incentive Calculation Procedure.

In Advance, please perform the Design Review and Utility Bill Review (if Applicable) for numbers to enter in Steps #1, #2 and #5.

Elevation Zone Table:			
Min Elevation	Max Elevation	Heating Season Days	Daily Panel Heat Output
-1000	1000	105	0
1001	3000	140	0
3001	5000	175	0
5001	7000	210	0
7001	9000	245	0
9001	11000	280	0

Collector Thermal Performance Rating Data From OG-100 Sheet		
Category:	Delta T	Clear Day
A	-9 Deg. F.	0
B	+9 Deg. F.	0
C	+36 Deg. F.	0
D	+90 Deg. F.	0
E	+144 Deg. F.	0

Enter Solar Panel Make and Model Number Selected for Project:

<b>Step #1:</b>	Enter the result of the Design Review of the Design Annual Building Loss =	<input type="text" value="0"/>	BTU/Year
<b>Step #2:</b>	Enter the result of the Utility Bill Review of the Actual Annual Building Loss: (If not Electric, Natural Gas or Propane Heat, enter 0) =	<input type="text" value="0"/>	BTU/Year
<b>Step #3:</b>	Calculate the Lesser of the Result in Step #1 & Step #2 = This is the Annual Building Heat Requirement.	<input type="text" value="0"/>	BTU/Year
<b>Step #4:</b>	Enter Elevation of the Solar Space Heated Building:	<input type="text" value="0"/>	Feet AMSL
<b>Step #4 cont:</b>	Number of Heating Days per Heating Season from Elevation Zone Table:	<input type="text" value="105"/>	Days per Year
<b>Step #4 cont:</b>	Calculate Average Daily Building Heat Requirement =	<input type="text" value="0"/>	BTU/Day
<b>Step #5:</b>	Enter Passive Heat Storage Specific Heat Capacity from Building Design Review:	<input type="text" value="0"/>	BTU/Deg. F.
<b>Step #5 cont:</b>	Enter Maximum Daily Room Temperature Variation Allowed by Building Occupants: (Max of 10 Degrees F.)	<input type="text" value="0"/>	Degrees F.
<b>Step #5 cont:</b>	Calculate Maximum Passive Heat Storage Capacity =	<input type="text" value="0"/>	BTU
<b>Step #5 cont:</b>	Enter Total Active Heat Storage Heat Capacity from Building Design Review:	<input type="text" value="0"/>	BTU
<b>Step #5 cont:</b>	Calculate Maximum Total Heat Storage Capacity =	<input type="text" value="0"/>	BTU
<b>Step #6:</b>	Calculate the Lesser of the Average Daily Building Heat Requirement in Step #4 and the Maximum Total Storage Capacity in Step #5. This is the Maximum Useful Daily Solar Heat Input.	<input type="text" value="0"/>	BTU/Day
<b>Step #7:</b>	Size the Solar Panels based on a total daily solar heat input no greater than the Maximum Useful Daily Solar Heat Input. Enter the single panel SRCC OG-100 Collector Thermal Performance Rating data in the Table Above.	<input type="text" value="0"/>	BTU/Day per Panel
<b>Step #7cont:</b>	Enter the Total number of solar panels to be installed:	<input type="text" value="0"/>	# of Panels
<b>Step #7cont:</b>	Calculate the Average Expected Daily Solar Heat Input:	<input type="text" value="0"/>	BTU/Day
<b>Step #8:</b>	Calculate the Expected Annual Useful Solar KWH Heat Input using the Number of Heating Days times the Average Expected Daily Solar Heat Input / 3415 BTU/KWH:	<input type="text" value="0"/>	KWH/Year
<b>Step #9:</b>	Enter the UFI per first year KWH UCPP Incentive Rate:	<input type="text" value="\$0.75"/>	\$/KWH
<b>Step #9 cont:</b>	Calculate the Total Maximum UFI Payment Subject to Possible Limitation by the 50% of Initial Cost Cap & 15% Minimum Customer Contribution:	<input type="text" value="\$0.00"/>	\$
<b>Step #10:</b>	Enter the Total Solar Space Heating System Initial Cost: This should not include costs for Passive Heat Storage or Building Heating System.	<input type="text" value="\$0.00"/>	\$
<b>Step #10 cont:</b>	Calculate the Total Expected Federal and Arizona Incentives for this Project:	<input type="text" value="\$0.00"/>	\$
<b>Step #10 cont:</b>	Calculate the 15% minimum of the Total Solar Space Heating System Initial Cost to be paid by Customer	<input type="text" value="\$0.00"/>	\$
<b>Step #10 cont:</b>	Calculate the Total Actual UFI Payment:	<input type="text" value="\$0.00"/>	\$

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BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

MIKE GLEASON – CHAIRMAN  
WILLIAM A. MUNDELL  
JEFF HATCH-MILLER  
KRISTIN K. MAYES  
GARY PIERCE

IN THE MATTER OF THE APPLICATION OF )  
UNS ELECTRIC, INC. FOR APPROVAL OF ITS )  
RENEWABLE ENERGY STANDARD AND )  
TARIFF IMPLEMENTATION PLAN. )

DOCKET NO. E-04204A-07-\_\_\_\_\_

**APPLICATION FOR APPROVAL  
OF UNS ELECTRIC, INC.'S  
RENEWABLE ENERGY  
STANDARD IMPLEMENTATION  
PLAN AND ASSOCIATED TARIFF**

Volume 2



# EXHIBIT 3



**UNS Electric, Inc.'s Renewable Energy Standard & Tariff**  
**Performance Incentive Mechanism**  
**Calculation Description and Example**

The intended result of successful renewable energy distributed generation ("DG") programs is the production of renewable energy at customer premises while reducing the consumption of utility provided electric energy consumption and/or electric demand. While this reduces the variable and/or fixed costs of producing electrical energy for an electric utility, it also reduces the revenue derived from energy consumption based rates and reduces the opportunity for the utility to earn a return on assets. These intended results are mitigated by the implementation of a performance incentive by providing customers with a 92% share and UNS Electric, Inc. ("UNS Electric") with 8% share of the overall net benefits of the REST program expenses on an annual basis. During the first year of REST programs there would not be any performance incentive from prior year renewable energy DG programs. Therefore, the performance incentive would start after the first full year of implementation – giving time for renewable energy DG programs to ramp up and reach their potential.

Use of the REST Performance Incentive Mechanism would require UNS Electric to annually file the following information:

- Actual net REST renewable DG energy production from customer sited meters measuring the output of each customer sited renewable electric generator. ("RESTDGEPPY");
- Total Retail Sales for the prior year ("TRSPY");
- Actual REST expenses for the prior year ("ARESTEPY");
- The Performance Incentive Target ("PIT"), which is the target percentage of renewable DG produced energy as a percentage of total retail sales energy approved in the REST Implementation Plan for the prior year; (UNS Electric is requesting the PIT be set at 0.5% in 2008, 2009 and 2010 to match the maximum annual REST DG percentage requirement in 2010.)
- The Performance Incentive Cap ("PIC"), which is the maximum percentage of the amount of prior year REST expenses to be allowed to be awarded as a REST Performance Incentive approved in the REST Implementation Plan for the prior year. (UNS Electric is requesting the PIC be set at 8.0% for a sharing of 92% of benefits with customers.)
- The Performance Incentive Baseline ("PIB"), which is the amount of renewable DG produced energy that was being generated at the time of the test year in the last approved rate case. (UNS Electric is requesting the PIB be set at 0 kWh.)



The REST Performance Incentive Mechanism would be calculated as follows:

- The PIB would be subtracted from the RESTDGEPPY.
- That result would be divided by the TRSPY.
- That resulting quotient would be divided by the PIT.
- If the resulting quotient was greater than 1.000, it would be limited to 1.000.
- That resulting quotient/comparison would be multiplied by the PIC as a decimal.
- That resulting product would be multiplied by the ARESTEPY to be the calculated Actual Performance Incentive value, ARESTPIPY.

A hypothetical example calculating the ARESTPIPY in year 2008:

- In 2008, the RESTDGEPPY from metered data was 5,235,593 kWh.
- In 2008, the TRSPY was 1,762,733,249 kWh.
- In 2008, the ARESTEPY was \$6,679,586.
- For 2008 the PIT was 0.5% = 0.005
- For 2008 the PIC was 8.0% = 0.08
- For 2008 the PIB was 0 kWh

Percent of Target Value =  $(( (5,235,593 - 0) / 1,762,733,249) / 0.005) = 0.594031 \leq 1.000$   
(Yes – Use 0.594031 in the next step)

REST Performance Incentive = ARESTPIPY =  $((0.594031 * 0.08) * \$6,679,586) = \$317,431$



# EXHIBIT 4

**UNS Electric, Inc.'s Renewable Energy Standard & Tariff  
Adjustor Mechanism and Tariff Surcharge Rate  
Calculation Description and Example**

Annually UNS Electric, Inc. ("UNS Electric") shall file support for modification to its REST Adjustor Mechanism and Tariff Surcharge rate for the following year. The REST Adjustor Mechanism will provide revenue recovery for: 1) expenses incurred by UNS Electric for all REST program implementation and; 2) the REST Performance Incentive to more closely align the interests of UNS Electric and customers in supporting the renewable energy distributed generation program element for UCPP program success.

The filing for modification of the REST Adjustor Mechanism for example year 2010 will include the following information:

- An itemized list of the expected costs of each REST program for the next year, in this example 2010. The expected expenses will be itemized into the cost categories of: (1) purchased renewable energy expenses, (2) customer sited distributed renewable energy expenses, (3) customer care and billing program expenses, (4) energy management system and energy accounting and settlements expenses, (5) net metering expenses, (6) reporting expenses, (7) outside coordination and support expenses and (8) renewable energy hardware development expenses. The total of these expected costs is the total REST expenses of the next year ("TRESTENY").
- An itemized list of the actual expenses of each REST program provided in the previous year, in this example 2008, in the cost categories of: (1) purchased renewable energy expenses, (2) customer sited distributed renewable energy expenses, (3) customer care and billing program expenses, (4) energy management system and energy accounting and settlements expenses, (5) net metering expenses, (6) reporting expenses, (7) outside coordination and support expenses and (8) renewable energy hardware development expenses. The total of these actual expenses is the total REST expenses of the previous year ("ARESTEPTY").
- The actual revenue produced by the REST Adjustor Mechanism the previous year ("ARESTRPY") from UNS Electric accounting records of the previous year, in this example 2008.
- The REST Performance Incentive revenue requirement expected to be recovered for the previous year, in this example 2008, ("ARESTPIPY").
- Total number of kWh of retail energy sold for which the for which the REST Tariff Surcharge was paid in the prior year, per the categories of (1) Residential, (2) Small Commercial and (3) Large Commercial customers, in this example 2008, The total of the number of kWh of retail energy sold for which the REST Tariff Surcharge was paid. ("TRESTTSkWhPY")
- The REST Tariff Surcharge and Cap amounts from the prior year. ("RESTTSAPY", "RESTTSResCapPY", RESTTSSmComCapPY" and "RESTTSLgComCapPY")

- The ratio of the next year REST per kWh Tariff Surcharge to the past year REST per kWh Tariff Surcharge will be applied to the past year customer monthly Tariff Surcharge Caps to derive the next year REST Tariff Surcharge Caps prior to any equity adjustment to the customer class cap ratios is applied.

The REST Adjustor Mechanism Rate ("RESTAMR") would then be calculated as:

$$\text{RESTAMR in } \$/\text{kWh} = ((\text{TRESTENY} + \text{ARESTEPY} + \text{ARESTPIPY} - \text{ARESTRPY}) / (\text{TRESTTSkWhPY}))$$

$$\text{RESTTSANY} = \text{RESTAMR}$$

The REST Tariff Surcharge Monthly Caps would then be calculated as:

$$\text{RESTTSResCapNY} = (\text{RESTTSResCapPY} * (\text{RESTTSANY} / \text{RESTTSAPY}))$$

$$\text{RESTTSSmComCapNY} = (\text{RESTTSSmComCapPY} * (\text{RESTTSANY} / \text{RESTTSAPY}))$$

$$\text{RESTTSLgComCapNY} = (\text{RESTTSLgComCapPY} * (\text{RESTTSANY} / \text{RESTTSAPY}))$$

A hypothetical example calculating the RESTPAMR and the RESTAPTSANY for this example in year 2010:

- In 2008, the TRESTEPY from operating the REST program was \$4,500,000.
- In 2008, the ARESTPIPY was to have been \$317,431.
- In 2008, the ARESTRPY billed and received was \$4,217,436.
- For 2010, UNS Electric proposes an REST program with expected TRESTENY cost of \$6,100,000.
- In 2008, the TRESTTSkWhPY was 845,516,440 kWh billed for the REST Tariff Surcharge
- In 2008 the REST Tariff surcharge amount, RESTTSAPY, was \$0.004988 per kWh and the monthly cap, RESTTSResCapPY, was \$5.20 per residential customer month, the RESTTSSmComCapPY was \$39.00 per small commercial customer month and the RESTTSLgComCapPY was \$1,500.00 per large customer month.

The REST RESTAMR and the RESTTSANY for example year 2010 would be:

$$((6,100,000 + 4,500,000 + 317,431 - 4,217,436) / (845,516,440)) = \$0.00792415 / \text{kWh}$$

Thus completing the Tariff Surcharge rate schedule for the REST in 2010:

$$\text{REST Tariff Rate for 2010} = \$0.00792415 \text{ per kWh.}$$

$$\text{Residential Cap for 2010} = (\$5.20 * (0.00792415 / 0.00498800)) = \$8.26 \text{ per month}$$

$$\text{Small commercial customer Cap for 2010} = (\$39.00 * (0.00792415 / 0.00498800)) = \$61.96 \text{ per month}$$

$$\text{Large commercial customer Cap for 2010} = (\$1,500.00 * (0.00792415 / 0.00498800)) = \$2,382.96 \text{ per month}$$



# EXHIBIT 5

**UNS Electric, Inc. Customer Distributed  
Energy Incentive Application Forms and  
Renewable Energy Credit Purchase  
Agreements for Administration of the  
UCPP**

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# UCPP Application Forms

**UNS ELECTRIC, INC.  
SOLAR SPACE COOLING APPLICATION**

**Customer Information**

Name (If Residential Application) \_\_\_\_\_  
Business Name (if Business Application) \_\_\_\_\_  
Mailing Address \_\_\_\_\_  
City \_\_\_\_\_, AZ Zip Code \_\_\_\_\_  
Street Address (if different from above) \_\_\_\_\_  
Daytime Phone Number \_\_\_\_\_  
E-mail Address: \_\_\_\_\_  
Account Number \_\_\_\_\_  
Operating Agent if different from Customer \_\_\_\_\_

**Solar Space Cooling System Information**

Equipment Supplier Name \_\_\_\_\_  
Equipment Manufacturer \_\_\_\_\_ Model Number \_\_\_\_\_  
Cooling Capacity of System \_\_\_\_\_ BTU  
Solar Collector Panel Rating \_\_\_\_\_ (SRCC)  
Performance Meter Type \_\_\_\_\_  
Material and Labor Warranty \_\_\_\_\_ Yrs (Copy of system warranty must be on file with UNS Electric, Inc.)  
**The material and labor must have warranty of at least five years.**  
Equipment Cost \_\_\_\_\_ Labor Cost \_\_\_\_\_ Total Cost \_\_\_\_\_  
Estimated Installation Date \_\_\_\_\_

**Project Information**

Energy and Designed Output Report Certification Provided \_\_\_\_ Yes \_\_\_\_ No  
Does this installation meet all ACC Interconnection/REST requirements?  
Has a City/County Permit been secured? \_\_\_\_ Yes \_\_\_\_ No

**System Qualifications**

The system must meet the requirements outlined in Attachment A of the Solar Space Cooling Agreement.



## **Rebate Calculation**

### *PBI Calculation*

Estimated annual energy production of system \_\_\_\_\_ kwh x PBI amount \_\_\_\_\_ \$/kwh = \_\_\_\_\_ PBI

Will payment be assigned to the installer or dealer of the qualifying space cooling system? \_\_\_\_ Yes \_\_\_\_ No

## **Installer Information**

Company Name \_\_\_\_\_

Installer's Name \_\_\_\_\_

Business Address \_\_\_\_\_

Arizona Registrar of Contractors (AZROC) License Information

AZROC License Number \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

Contractor's License \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

## **Assignment of Payment**

I authorize UNS Electric, Inc. (UNS Electric) to issue, on my behalf, my full rebate to the following installer as payment toward the cost and/or installation of my system. I acknowledge that the payment made to the below named installer satisfies the financial obligation to me in connection with the Agreement signed by myself and UNS Electric.

Company Name \_\_\_\_\_

Contact Person \_\_\_\_\_

Business Address \_\_\_\_\_

Customer Signature \_\_\_\_\_ Date \_\_\_\_\_

## **Inspection Authorization**

The SunShare Program requires that your solar space cooling system be inspected annually to ensure it is operating efficiently and safely. Presently UNS Electric outsources all SunShare inspection services to a qualified third-party contractor. Do you authorize UNS Electric to use a qualified third party contractor for your annual inspection?

Authorization Approved ☐ Authorization Denied ☐

There are animals in the yard that the Program Inspector needs to be aware of: \_\_\_\_ Yes \_\_\_\_ No

**UNS ELECTRIC, INC.**  
**BIOMASS/BIOGAS APPLICATION**

**Customer Information**

Business Name \_\_\_\_\_  
Mailing Address \_\_\_\_\_  
City \_\_\_\_\_, AZ Zip Code \_\_\_\_\_  
Street Address (if different from above) \_\_\_\_\_  
Daytime Phone Number \_\_\_\_\_  
E-mail Address: \_\_\_\_\_  
Account Number \_\_\_\_\_  
Operating Agent if different from Customer \_\_\_\_\_

**Biomass/Biogas System Information**

Technology/Application

- ☐ Biomass/Biogas Electric    ☐ Biomass/Biogas - CHP (Electric)    ☐ Biomass/Biogas – CHP (Thermal)  
☐ Biomass/Biogas (Thermal)    ☐ Biomass (Cooling)

Fuel Types Used

- ☐ Natural Gas    ☐ Landfill Methane    ☐ Digester methane    ☐ Diesel  
☐ Other Specify \_\_\_\_\_  
\_\_\_\_\_

Amount of Fuel Used Annually \_\_\_\_\_ Tons

Type of Dedicated Performance Meter \_\_\_\_\_

Energy Methods

- ☐ Direct Combustion    ☐ Chemical Conversion    ☐ Pyrolysis    ☐ Anaerobic Digestion    ☐ Fermentation

Biomass/Biogas Type

- ☐ Wood and agricultural    ☐ Solid Waste    ☐ Landfill gas and biogas    ☐ Alcohol Fuels  
☐ Other (Please explain)  
\_\_\_\_\_  
\_\_\_\_\_

System Warranty \_\_\_\_\_ Yrs (Copy of system warranty must be on file with UNS Electric, Inc.)

Generator Warranty \_\_\_\_\_ Yrs (Copy of generator warranty must be on file with UNS Electric, Inc.)

**The biomass/biogas energy system must be covered by a manufacturer's warranty of at least five years.**

Total Cost \_\_\_\_\_ Equipment Cost \_\_\_\_\_ Labor Cost \_\_\_\_\_

Estimated Installation Date \_\_\_\_\_

Boiler Inspection Identification Number \_\_\_\_\_

**Biomass system installations involving a regulated boiler or pressure vessel are required to comply with all Arizona state boiler regulations; provide a qualifying boiler inspection identification number; and keep all applicable permits in good standing.**

Method of Waste Disposal

\_\_\_\_\_  
\_\_\_\_\_

### **System Qualifications**

The system must meet the requirements outlined in Attachment A of the Biomass/Biogas Agreement.

### **Rebate Calculation**

Technology/Application	10-Year REC Agreement 10-Year Payment (\$/kWH)	15-Year REC Agreement 15-Year Payment (\$/kWH)	20-Year REC Agreement 20-Year Payment (\$/kWH)
Biomass-Biogas (Electric)	0.090	0.084	0.082
Biomass/Biogas – CHP (Electric) <sup>1</sup>	0.090	0.084	0.082
Biomass/Biogas – CHP (Thermal) <sup>1</sup>	0.0225	0.021	0.020
Biomass/Biogas (Thermal)	0.0225	0.021	0.020
Biomass/Biogas (Cooling)	0.048	0.045	0.042

<sup>1</sup> The CHP incentives may be used in combination for the appropriate components of one system.

Incentive Payment \_\_\_\_\_ X \_\_\_\_\_ Annual kilowatt hours = \$ \_\_\_\_\_

### **Assignment of Payment**

I authorize UNS Electric, Inc. (UNS Electric) to issue, on my behalf, my full rebate to the following installer as payment toward the cost and/or installation of my PV system. I acknowledge that the payment made to the below named installer satisfies the financial obligation to me in connection with the Agreement signed by myself and UNS Electric.

Company Name \_\_\_\_\_

Contact Person \_\_\_\_\_

Business Address \_\_\_\_\_

Customer Signature \_\_\_\_\_ Date \_\_\_\_\_

### **Project Information**

Conforming project: \_\_\_\_\_ Yes \_\_\_\_\_ No (Please refer to \_\_\_\_\_ for an explanation)

Project type: ☐ On Grid Interconnection ☐ Off Grid Interconnecton

Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a qualified registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.

### **Installer Information**

Company Name \_\_\_\_\_

Installer's Name \_\_\_\_\_

Business Address \_\_\_\_\_

Arizona Registrar of Contractors (AZROC) License Information

AZROC License Number \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

Contractor's License \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

### **Inspection Authorization**

The SunShare Program requires that your system be inspected annually through 2012 to ensure it is operating efficiently and safely. Presently UNS Electric outsources all SunShare inspection services to a qualified third-party contractor. Do you authorize UNS Electric to use a qualified third party contractor for your annual inspection?

Authorization Agreed ☐

Authorization Denied ☐

# UNS ELECTRIC, INC. GEOTHERMAL APPLICATION

## Customer Information

Business Name \_\_\_\_\_  
Mailing Address \_\_\_\_\_  
City \_\_\_\_\_, AZ Zip Code \_\_\_\_\_  
Street Address (if different from above) \_\_\_\_\_  
Daytime Phone Number \_\_\_\_\_  
E-mail Address \_\_\_\_\_  
Account Number \_\_\_\_\_  
Operating Agent if different from Customer \_\_\_\_\_

## Geothermal System Information

☐ Geothermal (Electric)      ☐ Geothermal (Thermal)      ☐ Geothermal (Cooling)

<input type="checkbox"/> Direct	<input type="checkbox"/> Vertical Well
<input type="checkbox"/> Indirect	<input type="checkbox"/> Horizontal Loop

Total liner feet of in-ground heat exchange material

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Expected Minimum ground temperature \_\_\_\_\_

Expected Maximum ground temperature \_\_\_\_\_

Processed fuel type \_\_\_\_\_

Describe Freeze Protection Methods

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

System Warranty \_\_\_\_\_ Yrs (Copy of system warranty must be on file with UNS Electric, Inc.)

Generator Warranty \_\_\_\_\_ Yrs (Copy of generator warranty must be on file with UNS Electric, Inc.)

**The geothermal energy system must be covered by a manufacturer's warranty of at least five years.**

Total Cost \_\_\_\_\_ Equipment Cost \_\_\_\_\_ Labor Cost \_\_\_\_\_

Estimated Installation Date \_\_\_\_\_

### **System Qualifications**

The system must meet the requirements outlined in Attachment A of the Geothermal Agreement.

### **Rebate Calculation**

Technology/Application	10-Year REC Agreement	15-Year REC Agreement	20-Year REC Agreement
	10-Year Payment (\$/kWH)	15-Year Payment (\$/kWH)	20-Year Payment (\$/kWH)
Geothermal – (Electric)	0.090	0.084	0.080
Geothermal – (Thermal)	0.068	0.064	0.060
Geothermal – (Cooling)	0.090	0.084	0.082

Incentive Payment \_\_\_\_\_ X Annual kilowatt hours \_\_\_\_\_ = \$ \_\_\_\_\_

### **Assignment of Payment**

I authorize UNS Electric, Inc. (UNS Electric) to issue, on my behalf, my full rebate to the following installer as payment toward the cost and/or installation of my PV system. I acknowledge that the payment made to the below named installer satisfies the financial obligation to me in connection with the Agreement signed by myself and UNS Electric.

Company Name \_\_\_\_\_

Contact Person \_\_\_\_\_

Business Address \_\_\_\_\_

Customer Signature \_\_\_\_\_ Date \_\_\_\_\_

### **Project Information**

Project type: ☐ On Grid Interconnection ☐ Off Grid Interconnecton

### **Installer Information**

Company Name \_\_\_\_\_

Installer's Name \_\_\_\_\_

Business Address \_\_\_\_\_

Arizona Registrar of Contractors (AZROC) License Information

AZROC License Number \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

Contractor's License \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

### **Inspection Authorization**

The SunShare Program requires that your PV system be inspected annually through 2012 to ensure it is operating efficiently and safely. Presently UNS Electric outsources all SunShare inspection services to a qualified third-party contractor. Do you authorize UNS Electric to use a qualified third party contractor for your annual inspection?

Authorization Agreed ☐

Authorization Denied ☐

**UNS ELECTRIC, INC.**  
**NON-RESIDENTIAL SOLAR POOL HEATING APPLICATION**

**Customer Information**

Business \_\_\_\_\_  
Mailing Address \_\_\_\_\_  
City \_\_\_\_\_, AZ Zip Code \_\_\_\_\_  
Street Address (if different from above) \_\_\_\_\_  
Daytime Phone Number \_\_\_\_\_  
E-mail Address \_\_\_\_\_  
Account Number \_\_\_\_\_  
Operating Agent if different from Customer \_\_\_\_\_

**System Information**

Active ☐ Passive ☐

Description of power supplies or back up supplies for active systems

\_\_\_\_\_

Open Loop ☐ Closed Loop ☐

☐ Antifreeze ☐ Drainback ☐ Thermosiphon

Pump Type \_\_\_\_\_ Manufacturer \_\_\_\_\_

Controller Type \_\_\_\_\_ Manufacturer \_\_\_\_\_

Drainback \_\_\_\_\_ Manufacturer \_\_\_\_\_

Draindown \_\_\_\_\_ Manufacturer \_\_\_\_\_

Type of Antifreeze \_\_\_\_\_ Concentration of \_\_\_\_\_ Manufacturer of \_\_\_\_\_

Freeze Protection: Manual ☐ Automatic ☐ Back up ☐

Freeze Protection Description

\_\_\_\_\_

High Point Vents Designed \_\_\_\_\_

Low Point Drains Designed \_\_\_\_\_

Backup Heat: ☐ Boiler ☐ Instantaneous ☐ Standard Tank ☐ Combined Tank



OG-300 Rating \_\_\_\_\_

Horizontal Tilt Angle \_\_\_\_\_ Azimuth Angle \_\_\_\_\_ (+/- 60 degrees of due south)

Type of Mount \_\_\_\_\_ Roof (Must provide age of roof \_\_\_\_\_ yrs.) \_\_\_\_\_ Ground \_\_\_\_\_

Shading Issues \_\_\_\_\_

Water Analysis Review Performed ☐ Yes ☐ No

Cathodic ☐ Anodic ☐

Type of corrosion protection \_\_\_\_\_

Collector Manufacturer \_\_\_\_\_ Model \_\_\_\_\_ Quantity \_\_\_\_\_

Total Collector Area \_\_\_\_\_ Collector Material \_\_\_\_\_

Minimum collector wall thickness \_\_\_\_\_

Solar Storage Volume \_\_\_\_\_ Gallons

Heat Exchanger: ☐ Internal (Immersion) ☐ Wrap around the tank ☐ External ☐ None

Total Cost \_\_\_\_\_ PV Cost \_\_\_\_\_ Labor Cost \_\_\_\_\_

Estimated Installation Date \_\_\_\_\_

Reservation requests will include a manufacturer's verification disclosing that the system size and collector type proposed is appropriate for the specific application. The manufacturer's verification may be presented as a manufacturer's product specification sheet and will be included in the reservation request.

### Warranty Information

Contractors must provide a minimum of a five year equipment warranty as provided by the system manufacturer, including a minimum warranty period of five years for repair/replacement service to the customer.

Collector \_\_\_\_\_ years Storage \_\_\_\_\_ years Pump \_\_\_\_\_ years Controller \_\_\_\_\_ years

Installation/Workmanship Warranty \_\_\_\_\_ years

### Rebate Calculation

Heat Produced per BTU meter / 3,415 = Annual kWh hours \_\_\_\_\_ x \$0. \_\_\_\_\_ / kWh = \_\_\_\_\_

### Project Information

Has a City/County Permit been secured? \_\_\_\_\_ Yes \_\_\_\_\_ No

Does this installation meet all ACC Interconnection/REST requirements?

### **System Qualifications**

The system must meet the requirements outlined in Attachment A of the Non-Residential Solar Pool Heating Agreement.

### **Installer Information**

Company Name \_\_\_\_\_

Installer's Name \_\_\_\_\_

Business Address \_\_\_\_\_

Arizona Registrar of Contractors (AZROC) License Information

AZROC License Number \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

Contractor's License \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

### **Assignment of Payment**

I authorize UNS Electric, Inc. (UNS Electric) to issue, on my behalf, my full rebate to the following installer as payment toward the cost and/or installation of my PV system. I acknowledge that the payment made to the below named installer satisfies the financial obligation to me in connection with the Agreement signed by myself and UNS Electric.

Company Name \_\_\_\_\_

Contact Person \_\_\_\_\_

Business Address \_\_\_\_\_

Customer Signature \_\_\_\_\_ Date \_\_\_\_\_

### **Solar Water System Inspection Authorization**

Your system may be inspected annually through \_\_\_\_\_ to ensure it is operating efficiently and safely. Do you authorize UNS Electric to use a qualified third party contractor for your annual inspection?

Authorization Agreed ☐

Authorization Denied ☐

There are animals in the yard that the Program Inspector needs to be aware of: \_\_\_\_\_ Yes \_\_\_\_\_ No

**UNS ELECTRIC, INC.**  
**NON-RESIDENTIAL SOLAR WATER – SPACE HEATING APPLICATION**

**Customer Information**

Business \_\_\_\_\_  
Mailing Address \_\_\_\_\_  
City \_\_\_\_\_, AZ Zip Code \_\_\_\_\_  
Street Address (if different from above) \_\_\_\_\_  
Daytime Phone Number \_\_\_\_\_  
E-mail Address: \_\_\_\_\_  
Account Number \_\_\_\_\_  
Operating Agent if different from Customer \_\_\_\_\_

**System Information**

Active ☐ Passive ☐

Description of power supplies or back up supplies for active systems

\_\_\_\_\_

Active, open-loop systems are not eligible for UCPP incentives except for active, open-loop systems that have a proven technology or design that limits scaling and internal corrosion of system piping, and includes appropriate automatic methods for freeze protection. Details disclosing conformance with this exception shall be submitted as part of the manufacturer's verification documentation.

Open Loop ☐ Closed Loop ☐

☐ Antifreeze ☐ Drainback ☐ Thermosiphon

Pump Type \_\_\_\_\_ Manufacturer \_\_\_\_\_

Controller Type \_\_\_\_\_ Manufacturer \_\_\_\_\_

Drainback \_\_\_\_\_ Manufacturer \_\_\_\_\_

Draindown \_\_\_\_\_ Manufacturer \_\_\_\_\_

Type of Antifreeze \_\_\_\_\_ Concentration of \_\_\_\_\_ Manufacturer of \_\_\_\_\_

Freeze Protection Manual ☐ Automatic ☐ Back up ☐

Freeze Protection Description

\_\_\_\_\_

High Point Vents Designed \_\_\_\_\_

Low Point Drains Designed \_\_\_\_\_

Backup Heat    ☐ Boiler                      ☐ Instantaneous                      ☐ Standard Tank                      ☐ Combined Tank  
OG-300 Rating \_\_\_\_\_

**Domestic Solar Water Heating systems will be rated by the SRCC and meet the OG-300 system standard. Systems that include OG-100 collectors, but are not certified under OG-300, will need to be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer detailing annual energy savings. Solar Space Heating systems will utilize OG-100 collectors.**

Horizontal Tilt Angle \_\_\_\_\_ Azimuth Angle \_\_\_\_\_ (+/- 60 degrees of due south)

Type of Mount \_\_\_\_\_ Roof (Must provide age of roof \_\_\_\_\_ yrs.) \_\_\_\_\_ Ground

Shading Issues \_\_\_\_\_

Water Analysis Review Performed    ☐ Yes                      ☐ No

Cathodic ☐                                              Anodic ☐

Type of corrosion protection \_\_\_\_\_

Collector Manufacturer \_\_\_\_\_ Model \_\_\_\_\_ Quantity \_\_\_\_\_

Total Collector Area \_\_\_\_\_ Collector Material \_\_\_\_\_

Minimum collector wall thickness \_\_\_\_\_

Solar Storage Volume \_\_\_\_\_ Gallons

Heat Exchanger    ☐ Internal (Immersion)    ☐ Wrap around the tank    ☐ External    ☐ None

Total Cost \_\_\_\_\_ PV Cost \_\_\_\_\_ Labor Cost \_\_\_\_\_

Estimated Installation Date \_\_\_\_\_

**Reservation requests will include a manufacturer's verification disclosing that the system size and collector type proposed is appropriate for the specific application. The manufacturer's verification may be presented as a manufacturer's product specification sheet and will be included in the reservation request.**

### Warranty Information

**Contractors must provide a minimum of a five year equipment warranty as provided by the system manufacturer, including a minimum warranty period of five years for repair/replacement service to the customer.**

Collector \_\_\_\_\_ years                      Storage \_\_\_\_\_ years                      Pump \_\_\_\_\_ years                      Controller \_\_\_\_\_ years  
Installation/Workmanship Warranty \_\_\_\_\_ years

### **Rebate Calculation**

Heat Produced per BTU meter / 3,415 = Annual kWh hours \_\_\_\_\_ x PBI \$0. \_\_\_\_\_ = \_\_\_\_\_

### **Project Information**

Has a City/County Permit been secured? \_\_\_\_\_ Yes \_\_\_\_\_ No

Does this installation meet all ACC Interconnection/REST requirements?

### **System Qualifications**

The system must meet the requirements outlined in Attachment A of the Non-Residential Solar Water – Space Heating Agreement.

### **Installer Information**

Company Name \_\_\_\_\_

Installer's Name \_\_\_\_\_

Business Address \_\_\_\_\_

Arizona Registrar of Contractors (AZROC) License Information

AZROC License Number \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

Contractor's License \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

### **Assignment of Payment**

I authorize UNS Electric (UNS Electric) to issue, on my behalf, my full rebate to the following installer as payment toward the cost and/or installation of my PV system. I acknowledge that the payment made to the below named installer satisfies the financial obligation to me in connection with the Agreement signed by myself and UNS Electric.

Company Name \_\_\_\_\_

Contact Person \_\_\_\_\_

Business Address \_\_\_\_\_

Customer Signature \_\_\_\_\_ Date \_\_\_\_\_

### **Solar Water System Inspection Authorization**

Your system may be inspected annually through \_\_\_\_\_ to ensure it is operating efficiently and safely. Do you authorize UNS Electric to use a qualified third party contractor for your annual inspection?

Authorization Agreed ☐

Authorization Denied ☐

There are animals in the yard that the Program Inspector needs to be aware of: \_\_\_\_\_ Yes \_\_\_\_\_ No

**UNS ELECTRIC, INC.  
OFF-GRID SMALL WIND APPLICATION**

**Customer Information**

Name (If Residential Application) \_\_\_\_\_  
Business Name (if Business Application) \_\_\_\_\_  
Mailing Address \_\_\_\_\_  
City \_\_\_\_\_, AZ Zip Code \_\_\_\_\_  
Street Address (if different from above) \_\_\_\_\_  
Daytime Phone Number \_\_\_\_\_  
E-mail Address \_\_\_\_\_  
Account Number \_\_\_\_\_  
Operating Agent if different from Customer \_\_\_\_\_

**Wind System Information (for small systems of 1 MW or less)**

Wind System Supplier Name \_\_\_\_\_  
Generator Manufacturer \_\_\_\_\_ Type \_\_\_\_\_  
Nameplate Output \_\_\_\_\_ KWatts

**Larger wind systems of 100kW or more will be required to submit a detailed package describing site selection, energy production modeling and an engineered system design and installation report.  
Performance Based Incentives ("PBI") apply to larger systems**

System Warranty \_\_\_\_\_ Yrs (Copy of system warranty must be on file with UNS Electric, Inc.)  
Generator Warranty \_\_\_\_\_ Yrs (Copy of generator warranty must be on file with UNS Electric, Inc.)

**The wind generator and system must be covered by a manufacturer's warranty of at least five years.**

Equipment Cost \_\_\_\_\_ Labor Cost \_\_\_\_\_ Total Cost \_\_\_\_\_  
Estimated Installation Date \_\_\_\_\_

**Project Information**

Tower Design Stamped By Registered Engineer \_\_\_\_ Yes \_\_\_\_ No  
Does this installation meet all ACC Interconnection/REST requirements?  
Has a City/County Permit been secured? \_\_\_\_ Yes \_\_\_\_ No

## **System Qualifications**

The system must meet the requirements outlined in Attachment A of the Off-Grid Small Wind Agreement.

## **Rebate Calculation**

Eligible small wind systems must be certified and nameplate rated by the CEC. See [www.consumerenergycenter.org/erprebate/equipment.html](http://www.consumerenergycenter.org/erprebate/equipment.html) for a list of certified generators. For grid tied or off-grid wind generators where an inverter is used, the CEC listed nameplate rating of the wind generator will be multiplied by the CEC approved weighted efficiency percentage listed for the inverter in the "List of Eligible Inverters" at [www.consumerenergycenter.org/cgi-bin/eligible\\_inverters.cgi](http://www.consumerenergycenter.org/cgi-bin/eligible_inverters.cgi) to calculate the wind turbine nameplate rating for use in determining the UFI payment.

*UFI Calculation for residential projects with a 10 year warranty on the wind generator and system and wind generators with a nameplate rating of 100 kW or less.*

Rebate Calculation: \_\_\_\_\_ kW (Equivalent System Size) x \$ \_\_\_\_\_ per AC Watt = \_\_\_\_\_.

Rebate Calculation Self-Install: \_\_\_\_\_ kW (Equivalent System Size) x \$ \_\_\_\_\_ per AC Watt x 70% = \_\_\_\_\_

*PBI Calculation for residential projects with less than a 10 year warranty on the wind generator and system, or for systems greater than 100 kW.*

Estimated annual energy production of system \_\_\_\_\_ kwh x PBI amount \_\_\_\_\_ \$/kwh = \_\_\_\_\_ PBI

Will payment be assigned to the installer or dealer of the qualifying wind generator? \_\_\_\_ Yes \_\_\_\_ No

## **Installer Information**

Company Name \_\_\_\_\_

Installer's Name \_\_\_\_\_

Business Address \_\_\_\_\_

Arizona Registrar of Contractors (AZROC) License Information

AZROC License Number \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

Contractor's License \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

## **Assignment of Payment**

I authorize UNS Electric, Inc. (UNS Electric) to issue, on my behalf, my full rebate to the following installer as payment toward the cost and/or installation of my system. I acknowledge that the payment made to the below named installer satisfies the financial obligation to me in connection with the Agreement signed by myself and UNS Electric.

Company Name \_\_\_\_\_

Contact Person \_\_\_\_\_

Business Address \_\_\_\_\_

Customer Signature \_\_\_\_\_ Date \_\_\_\_\_



### **Inspection Authorization**

The SunShare Program requires that your wind system generator be inspected annually to ensure it is operating efficiently and safely. Presently UNS Electric outsources all SunShare inspection services to a qualified third-party contractor. Do you authorize UNS Electric to use a qualified third party contractor for your annual inspection?

Authorization Approved ☐ Authorization Denied ☐

There are animals in the yard that the Program Inspector needs to be aware of: \_\_\_\_\_ Yes \_\_\_\_\_ No

**UNS ELECTRIC, INC.  
OFF-GRID  
NON-RESIDENTIAL SOLAR ELECTRIC APPLICATION**



**Customer Information**

Business Name \_\_\_\_\_  
Mailing Address \_\_\_\_\_  
City \_\_\_\_\_, AZ Zip Code \_\_\_\_\_  
Street Address (if different from above) \_\_\_\_\_  
Daytime Phone Number \_\_\_\_\_  
E-mail Address \_\_\_\_\_  
Account Number \_\_\_\_\_  
Operating Agent if different from Customer \_\_\_\_\_

**Solar - PV System Information**

Module Supplier Name \_\_\_\_\_ Nameplate DC Rating \_\_\_\_\_ watts  
Module Manufacturer \_\_\_\_\_ Type \_\_\_\_\_ Quantity of Modules \_\_\_\_\_  
Module Warranty \_\_\_\_\_ years (Copy of warranty must be on file with UNS Electric, Inc.)  
Inverter Make and Model Number \_\_\_\_\_  
Inverter Warranty \_\_\_\_\_ years (Copy of inverter warranty must be on file with UNS Electric, Inc.)  
Total Cost \_\_\_\_\_ PV Cost \_\_\_\_\_ Labor Cost \_\_\_\_\_  
Estimated Installation Date \_\_\_\_\_

**System Qualifications**

The system must meet the requirements outlined in Attachment A of the Off-Grid Non-Residential Performance Based Incentive Agreement.

**Rebate Calculation**

*PBI Payment*

Estimated annual energy production of system \_\_\_\_\_ kwh x PBI amount \_\_\_\_\_ \$/kwh = \_\_\_\_\_ PBI  
Will payment be assigned to the installer or dealer of the qualifying solar system? \_\_\_\_\_ Yes \_\_\_\_\_ No

### **Project Information**

Has a City/County Permit been secured? \_\_\_\_\_ Yes \_\_\_\_\_ No

Is this an application for Net Metering: \_\_\_\_\_ Yes \_\_\_\_\_ No (Net metering applies to systems 10 kW AC or less)

Does this installation meet all ACC Interconnection/REST requirements?

### **Installer Information**

Company Name \_\_\_\_\_

Installer's Name \_\_\_\_\_

Business Address \_\_\_\_\_

Arizona Registrar of Contractors (AZROC) License Information

AZROC License Number \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

Contractor's License \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

### **Assignment of Payment**

I authorize UNS Electric, Inc. (UNS Electric) to issue, on my behalf, my full rebate to the following installer as payment toward the cost and/or installation of my PV system. I acknowledge that the payment made to the below named installer satisfies the financial obligation to me in connection with the Agreement signed by myself and UNS Electric.

Company Name \_\_\_\_\_

Contact Person \_\_\_\_\_

Business Address \_\_\_\_\_

Customer Signature \_\_\_\_\_ Date \_\_\_\_\_

### **Inspection Authorization**

The SunShare Program requires that your PV system be inspected annually through 2012 to ensure it is operating efficiently and safely. Presently UNS Electric outsources all SunShare inspection services to a qualified third-party contractor. Do you authorize UNS Electric to use a qualified third party contractor for your annual inspection?

Authorization Agreed ☐

Authorization Denied ☐

There are animals in the yard that the Program Inspector needs to be aware of: \_\_\_\_\_ Yes \_\_\_\_\_ No

**UNS ELECTRIC, INC.  
OFF-GRID  
RESIDENTIAL SOLAR ELECTRIC APPLICATION**



**Customer Information**

Name \_\_\_\_\_  
Mailing Address \_\_\_\_\_  
City \_\_\_\_\_, AZ Zip Code \_\_\_\_\_  
Street Address (if different from above) \_\_\_\_\_  
Daytime Phone Number \_\_\_\_\_  
E-mail Address \_\_\_\_\_  
Account Number \_\_\_\_\_  
Operating Agent if different from Customer \_\_\_\_\_

**Solar - PV System Information**

Module Supplier Name \_\_\_\_\_ Nameplate DC Rating \_\_\_\_\_ watts  
Module Manufacturer \_\_\_\_\_ Type \_\_\_\_\_ Quantity of Modules \_\_\_\_\_  
Module Warranty \_\_\_\_\_ years (Copy of warranty must be on file with UNS Electric, Inc.)  
Inverter Make and Model Number \_\_\_\_\_  
Inverter Warranty \_\_\_\_\_ years (Copy of inverter warranty must be on file with UNS Electric, Inc.).  
Total Cost \_\_\_\_\_ PV Cost \_\_\_\_\_ Labor Cost \_\_\_\_\_  
Estimated Installation Date \_\_\_\_\_

**System Qualifications**

The system must meet the requirements outlined in Attachment A and Attachment B of the Off-Grid Residential Solar Up Front Incentive or Performance Based Incentive Agreements.

**Rebate Calculation**

*UFI Calculation for residential projects with a 20 year or longer module warranty and a 10 year or longer inverter warranty.*

Rebate Calculation: \_\_\_\_\_ kW (System Size) x \$ \_\_\_\_\_ = \_\_\_\_\_ (UFI)

Rebate Calculation for Self-Install: \_\_\_\_\_ kW (System Size) x \$ \_\_\_\_\_ x 70% = \_\_\_\_\_

UFI – Residential BIPV 5 kW DC or less

Rebate Calculation: \_\_\_\_\_ kW (System Size) x \$ \_\_\_\_\_ x 90% = \_\_\_\_\_ (UFI)

*PBI Calculation for residential projects with less than a 20 year module warranty or less than a 10 year inverter warranty or for residential projects with a BIPV system over 5 kW .*

Estimated annual energy production of system \_\_\_\_\_ kwh x PBI amount \_\_\_\_\_ \$/kwh = \_\_\_\_\_ PBI

Will payment be assigned to the installer or dealer of the qualifying solar system? \_\_\_\_\_ Yes \_\_\_\_\_ No

### **Project Information**

Has a City/County Permit been secured? \_\_\_\_\_ Yes \_\_\_\_\_ No

Is this an application for Net Metering: \_\_\_\_\_ Yes \_\_\_\_\_ No (Net metering applies to systems 10 kW AC or less)

Does this installation meet all ACC Interconnection/REST requirements?

### **Installer Information**

Company Name \_\_\_\_\_

Installer's Name \_\_\_\_\_

Business Address \_\_\_\_\_

Arizona Registrar of Contractors (AZROC) License Information

AZROC License Number \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

Contractor's License \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

### **Assignment of Payment**

I authorize UNS Electric, Inc. (UNS Electric) to issue, on my behalf, my full rebate to the following installer as payment toward the cost and/or installation of my PV system. I acknowledge that the payment made to the below named installer satisfies the financial obligation to me in connection with the Agreement signed by myself and UNS Electric.

Company Name \_\_\_\_\_

Contact Person \_\_\_\_\_

Business Address \_\_\_\_\_

Customer Signature \_\_\_\_\_ Date \_\_\_\_\_

### **Inspection Authorization**

The SunShare Program requires that your PV system be inspected annually through 2012 to ensure it is operating efficiently and safely. Presently UNS Electric outsources all SunShare inspection services to a qualified third-party contractor. Do you authorize UNS Electric to use a qualified third party contractor for your annual inspection?

Authorization Agreed ☐  
Authorization Denied ☐

There are animals in the yard that the Program Inspector needs to be aware of: \_\_\_\_\_ Yes \_\_\_\_\_ No

**UNS ELECTRIC, INC.  
ON-GRID  
NON-RESIDENTIAL (20 kW or LESS)  
SOLAR ELECTRIC APPLICATION**



**Customer Information**

Business Name \_\_\_\_\_  
Mailing Address \_\_\_\_\_  
City \_\_\_\_\_, AZ Zip Code \_\_\_\_\_  
Street Address (if different from above) \_\_\_\_\_  
Daytime Phone Number \_\_\_\_\_  
E-mail Address \_\_\_\_\_  
Account Number \_\_\_\_\_  
Operating Agent if different from Customer \_\_\_\_\_

**Solar - PV System Information**

Module Supplier Name \_\_\_\_\_ Nameplate DC Rating \_\_\_\_\_ watts  
Module Manufacturer \_\_\_\_\_ Type \_\_\_\_\_ Quantity of Modules \_\_\_\_\_  
Module Warranty \_\_\_\_\_ year (Copy of warranty must be on file with UNS Electric, Inc.)  
Inverter Make and Model Number \_\_\_\_\_  
Inverter Warranty \_\_\_\_\_ year (Copy of inverter warranty must be on file with UNS Electric, Inc.)  
Total Cost \_\_\_\_\_ PV Cost \_\_\_\_\_ Labor Cost \_\_\_\_\_  
Estimated Installation Date \_\_\_\_\_

**System Qualifications**

The system must meet the requirements outlined in Attachment A and Attachment B of the On-Grid Non-Residential Solar 20 kW or Less Up Front Incentive or Performance Based Incentive Agreements.

**Rebate Calculation**

Rebate Calculation: Nameplate Rating \_\_\_\_\_ x Quantity of Panels \_\_\_\_\_ = System Size

UFI Calculation for non-residential projects under 20 kW with a 10 year inverter warranty.

Rebate Calculation: \_\_\_\_\_ kW (System Size) x \$ \_\_\_\_\_ = \_\_\_\_\_ (UFI)

UFI – Non-Residential BIPV 5 kW DC or less

Rebate Calculation: \_\_\_\_\_ kW (System Size) x \$ \_\_\_\_\_ x 90% = \_\_\_\_\_ (UFI)

PBI Calculation for non-residential projects under 20 kW with less than a 20 year module warranty or less than a 10 year inverter warranty or for non-residential projects under 20 kW with a BIPV system over 5 kW .

Estimated annual energy production of system \_\_\_\_\_ kwh x PBI amount \_\_\_\_\_ \$/kwh = \_\_\_\_\_ PBI

Will payment be assigned to the installer or dealer of the qualifying solar system? \_\_\_\_\_ Yes \_\_\_\_\_ No

### **Project Information**

Has a City/County Permit been secured? \_\_\_\_\_ Yes \_\_\_\_\_ No

Is this an application for Net Metering: \_\_\_\_\_ Yes \_\_\_\_\_ No (Net metering applies to systems 10 kW AC or less)

Does this installation meet all ACC Interconnection/REST requirements? \_\_\_\_\_ Yes \_\_\_\_\_ No

### **Installer Information**

Company Name \_\_\_\_\_

Installer's Name \_\_\_\_\_

Business Address \_\_\_\_\_

Arizona Registrar of Contractors (AZROC) License Information

AZROC License Number \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

Contractor's License \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

### **Assignment of Payment**

I authorize UNS Electric, Inc. (UNS Electric) to issue, on my behalf, my full rebate to the following installer as payment toward the cost and/or installation of my PV system. I acknowledge that the payment made to the below named installer satisfies the financial obligation to me in connection with the Agreement signed by myself and UNS Electric.

Company Name \_\_\_\_\_

Contact Person \_\_\_\_\_

Business Address \_\_\_\_\_

Customer Signature \_\_\_\_\_ Date \_\_\_\_\_



### **Inspection Authorization**

The SunShare Program requires that your PV system be inspected annually through 2012 to ensure it is operating efficiently and safely. Presently UNS Electric outsources all SunShare inspection services to a qualified third-party contractor. Do you authorize UNS Electric to use a qualified third party contractor for your annual inspection?

Authorization Agreed ☐  
Authorization Denied ☐

There are animals in the yard that the Program Inspector needs to be aware of: \_\_\_\_\_ Yes \_\_\_\_\_ No

**UNS ELECTRIC, INC.  
ON-GRID  
NON-RESIDENTIAL (GREATER THAN 20 kW)  
SOLAR ELECTRIC APPLICATION**



**Customer Information**

Business Name \_\_\_\_\_  
Mailing Address \_\_\_\_\_  
City \_\_\_\_\_, AZ Zip Code \_\_\_\_\_  
Street Address (if different from above) \_\_\_\_\_  
Daytime Phone Number \_\_\_\_\_  
E-mail Address \_\_\_\_\_  
Account Number \_\_\_\_\_  
Operating Agent if different from Customer \_\_\_\_\_

**Solar - PV System Information**

Module Supplier Name \_\_\_\_\_ Nameplate DC Rating \_\_\_\_\_ watts  
Module Manufacturer \_\_\_\_\_ Type \_\_\_\_\_ Quantity of Modules \_\_\_\_\_  
Module Warranty \_\_\_\_\_ years (Copy of warranty must be on file with UNS Electric, Inc.)  
Inverter Make and Model Number \_\_\_\_\_  
Inverter Warranty \_\_\_\_\_ years (Copy of inverter warranty must be on file with UNS Electric, Inc.)  
Total Cost \_\_\_\_\_ PV Cost \_\_\_\_\_ Labor Cost \_\_\_\_\_  
Estimated Installation Date \_\_\_\_\_

**System Qualifications**

The system must meet the requirements outlined in Attachment A and Attachment B and C of the Non-Residential On-Grid Solar Generation 20 kW or Greater Performance Based Incentive Agreement.

**Rebate Calculation**

*PBI Calculation for non-residential projects greater than 20 kW.*

Estimated annual energy production of system \_\_\_\_\_ kwh x PBI amount \_\_\_\_\_ \$/kwh = \_\_\_\_\_

Will payment be assigned to the installer or dealer of the qualifying solar system? \_\_\_\_\_ Yes \_\_\_\_\_ No

### **Project Information**

Has a City/County Permit been secured? \_\_\_\_\_ Yes \_\_\_\_\_ No

Does this installation meet all ACC Interconnection/REST requirements?

### **Installer Information**

Company Name \_\_\_\_\_

Installer's Name \_\_\_\_\_

Business Address \_\_\_\_\_

Arizona Registrar of Contractors (AZROC) License Information

AZROC License Number \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

Contractor's License \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

### **Assignment of Payment**

I authorize UNS Electric, Inc. (UNS Electric) to issue, on my behalf, my full rebate to the following installer as payment toward the cost and/or installation of my PV system. I acknowledge that the payment made to the below named installer satisfies the financial obligation to me in connection with the Agreement signed by myself and UNS Electric.

Company Name \_\_\_\_\_

Contact Person \_\_\_\_\_

Business Address \_\_\_\_\_

Customer Signature \_\_\_\_\_ Date \_\_\_\_\_

### **Inspection Authorization**

The SunShare Program requires that your PV system be inspected annually through 2012 to ensure it is operating efficiently and safely. Presently UNS Electric outsources all SunShare inspection services to a qualified third-party contractor. Do you authorize UNS Electric to use a qualified third party contractor for your annual inspection?

Authorization Agreed ☐

Authorization Denied ☐

There are animals in the yard that the Program Inspector needs to be aware of: \_\_\_\_\_ Yes \_\_\_\_\_ No

**UNS ELECTRIC, INC.  
ON-GRID SMALL WIND APPLICATION**

**Customer Information**

Name (If Residential Application) \_\_\_\_\_  
Business Name (if Business Application) \_\_\_\_\_  
Mailing Address \_\_\_\_\_  
City \_\_\_\_\_, AZ Zip Code \_\_\_\_\_  
Street Address (if different from above) \_\_\_\_\_  
Daytime Phone Number \_\_\_\_\_  
E-mail Address \_\_\_\_\_  
Account Number \_\_\_\_\_  
Operating Agent if different from Customer \_\_\_\_\_

**Wind System Information (for small systems of 1 MW or less)**

Wind System Supplier Name \_\_\_\_\_  
Generator Manufacturer \_\_\_\_\_ Type \_\_\_\_\_  
Nameplate Output \_\_\_\_\_ Watts.

**Larger wind systems of 100kW or more will be required to submit a detailed package describing site selection, energy production modeling and an engineered system design and installation report.**

**Performance Based Incentives ("PBI") apply to larger systems**

System Warranty \_\_\_\_\_ Yrs (Copy of system warranty must be on file with UNS Electric, Inc.)

Generator Warranty \_\_\_\_\_ Yrs (Copy of generator warranty must be on file with UNS Electric, Inc.)

**The wind generator and system must be covered by a manufacturer's warranty of at least five years.**

Equipment Cost \_\_\_\_\_ Labor Cost \_\_\_\_\_ Total Cost \_\_\_\_\_

Estimated Installation Date \_\_\_\_\_

**Project Information**

Does this installation meet all ACC Interconnection/REST requirements?

Has a City/County Permit been secured? \_\_\_\_\_ Yes \_\_\_\_\_ No

**System Qualifications**

The system must meet the requirements outlined in Attachment A of the On-Grid Small Wind Agreement.

## **Rebate Calculation**

Eligible small wind systems must be certified and nameplate rated by the CEC. See [www.consumerenergycenter.org/erprebate/equipment.html](http://www.consumerenergycenter.org/erprebate/equipment.html) for a list of certified generators. For grid tied or off-grid wind generators where an inverter is used, the CEC listed nameplate rating of the wind generator will be multiplied by the CEC approved weighted efficiency percentage listed for the inverter in the "List of Eligible Inverters" at [www.consumerenergycenter.org/cgi-bin/eligible\\_inverters.cgi](http://www.consumerenergycenter.org/cgi-bin/eligible_inverters.cgi) to calculate the wind turbine nameplate rating for use in determining the UFI payment.

*UFI Calculation for residential projects with a 10 year warranty on the wind generator and system and **wind generators with a nameplate rating of 100 kW or less.***

Rebate Calculation: \_\_\_\_\_ kW (Equivalent System Size) x \$ \_\_\_\_\_ per AC Watt = \_\_\_\_\_ UFI

Rebate Calculation Self-Install: \_\_\_\_\_ kW (Equivalent System Size) x \$ \_\_\_\_\_ per AC Watt x 70% = \_\_\_\_\_

*PBI Calculation for residential projects with less than a 10 year warranty on the wind generator and system, or for systems greater than 100 kW.*

Estimated annual energy production of system \_\_\_\_\_ kwh x PBI amount \_\_\_\_\_ \$/kwh = \_\_\_\_\_ PBI

Will payment be assigned to the installer or dealer of the qualifying wind generator? \_\_\_\_\_ Yes \_\_\_\_\_ No

## **Installer Information**

Company Name \_\_\_\_\_

Installer's Name \_\_\_\_\_

Business Address \_\_\_\_\_

Arizona Registrar of Contractors (AZROC) License Information

AZROC License Number \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

Contractor's License \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

## **Assignment of Payment**

I authorize UNS Electric, Inc. (UNS Electric) to issue, on my behalf, my full rebate to the following installer as payment toward the cost and/or installation of my system. I acknowledge that the payment made to the below named installer satisfies the financial obligation to me in connection with the Agreement signed by myself and UNS Electric.

Company Name \_\_\_\_\_

Contact Person \_\_\_\_\_

Business Address \_\_\_\_\_

Customer Signature \_\_\_\_\_ Date \_\_\_\_\_

### **Inspection Authorization**

The SunShare Program requires that your wind system generator be inspected annually to ensure it is operating efficiently and safely. Presently UNS Electric outsources all SunShare inspection services to a qualified third-party contractor. Do you authorize UNS Electric to use a qualified third party contractor for your annual inspection?

Authorization Agreed ☐      Authorization Denied ☐

There are animals in the yard that the Program Inspector needs to be aware of: \_\_\_\_\_ Yes \_\_\_\_\_ No

**UNS ELECTRIC, INC.**  
**ON-GRID RESIDENTIAL SOLAR ELECTRIC APPLICATION**



**Customer Information**

Name \_\_\_\_\_  
Mailing Address \_\_\_\_\_  
City \_\_\_\_\_, AZ Zip Code \_\_\_\_\_  
Street Address (if different from above) \_\_\_\_\_  
Daytime Phone Number \_\_\_\_\_  
E-mail Address: \_\_\_\_\_  
Account Number \_\_\_\_\_  
Operating Agent if different from Customer \_\_\_\_\_

**Solar - PV System Information**

Module Supplier Name \_\_\_\_\_ Nameplate DC Rating \_\_\_\_\_ watts  
Module Manufacturer \_\_\_\_\_ Type \_\_\_\_\_ Quantity of Modules \_\_\_\_\_  
Module Warranty \_\_\_\_\_ years (Copy of warranty must be on file with UNS Electric, Inc.)  
Inverter Make and Model Number \_\_\_\_\_  
Inverter Warranty \_\_\_\_\_ years (Copy of inverter warranty must be on file with UNS Electric, Inc.)  
Total Cost \_\_\_\_\_ PV Cost \_\_\_\_\_ Labor Cost \_\_\_\_\_  
Estimated Installation Date \_\_\_\_\_

**System Qualifications**

The system must meet the requirements outlined in Attachment A and Attachment B of the On-Grid Residential Solar Up Front Incentive or Performance Based Incentive Agreements.

**Rebate Calculation**

Rebate Calculation: Nameplate Rating \_\_\_\_\_ Watts x Quantity of Panels \_\_\_\_\_ = System Size

*UFI Calculation for residential projects with a 10 year inverter warranty.*

Rebate Calculation: \_\_\_\_\_ kW (System Size) x \$TBD per kW = \_\_\_\_\_

Rebate Calculation for Self-Install: \_\_\_\_\_ kW (System Size) x \$TBD x 70% = \_\_\_\_\_

UFI – Residential BIPV 5 kW DC or less

Rebate Calculation: \_\_\_\_\_ kW (System Size) x \$ \_\_\_\_\_ x 90% = \_\_\_\_\_ (UFI)

*PBI Calculation for residential projects with less than a 20 year module warranty or less than a 10 year inverter warranty or for residential projects with a BIPV system over 5 kW .*

Estimated annual energy production of system \_\_\_\_\_ kwh x PBI amount \_\_\_\_\_ \$/kwh = \_\_\_\_\_ PBI

Will payment be assigned to the installer or dealer of the qualifying solar system? \_\_\_\_\_ Yes \_\_\_\_\_ No

### **Project Information**

Has a City/County Permit been secured? \_\_\_\_\_ Yes \_\_\_\_\_ No

Is this an application for Net Metering: \_\_\_\_\_ Yes \_\_\_\_\_ No (Net metering applies to systems 10 kW AC or less)

Does this installation meet all ACC Interconnection/REST requirements? \_\_\_\_\_ Yes \_\_\_\_\_ No

### **Installer Information**

Company Name \_\_\_\_\_

Installer's Name \_\_\_\_\_

Business Address \_\_\_\_\_

Arizona Registrar of Contractors (AZROC) License Information

AZROC License Number \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

Contractor's License \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

### **Assignment of Payment**

I authorize UNS Electric, Inc. (UNS Electric) to issue, on my behalf, my full rebate to the following installer as payment toward the cost and/or installation of my PV system. I acknowledge that the payment made to the below named installer satisfies the financial obligation to me in connection with the Agreement signed by myself and UNS Electric.

Company Name \_\_\_\_\_

Contact Person \_\_\_\_\_

Business Address \_\_\_\_\_

Customer Signature \_\_\_\_\_ Date \_\_\_\_\_



### **Inspection Authorization**

The SunShare Program requires that your PV system be inspected annually through 2012 to ensure it is operating efficiently and safely. Presently UNS Electric outsources all SunShare inspection services to a qualified third-party contractor. Do you authorize UNS Electric to use a qualified third party contractor for your annual inspection?

Authorization Agreed ☐  
Authorization Denied ☐

There are animals in the yard that the Program Inspector needs to be aware of: \_\_\_\_\_ Yes \_\_\_\_\_ No

**UNS ELECTRIC, INC.**  
**RESIDENTIAL SOLAR WATER – SPACE HEATING APPLICATION**

**Customer Information**

Name \_\_\_\_\_  
Mailing Address \_\_\_\_\_  
City \_\_\_\_\_, AZ Zip Code \_\_\_\_\_  
Street Address (if different from above) \_\_\_\_\_  
Daytime Phone Number \_\_\_\_\_  
E-mail Address \_\_\_\_\_  
Account Number \_\_\_\_\_  
Operating Agent if different from Customer \_\_\_\_\_

**System Information**

Active ☐ Passive ☐

Description of power supplies or back up supplies for active systems

\_\_\_\_\_  
\_\_\_\_\_

**Active, open-loop systems are not eligible for UCPP incentives except for active, open-loop systems that have a proven technology or design that limits scaling and internal corrosion of system piping, and includes appropriate automatic methods for freeze protection. Details disclosing conformance with this exception shall be submitted as part of the manufacturer's verification documentation.**

Open Loop ☐ Closed Loop ☐

☐ Antifreeze ☐ Drainback ☐ Thermosiphon

Pump Type \_\_\_\_\_ Manufacturer \_\_\_\_\_

Controller Type \_\_\_\_\_ Manufacturer \_\_\_\_\_

Drainback \_\_\_\_\_ Manufacturer \_\_\_\_\_

Draindown \_\_\_\_\_ Manufacturer \_\_\_\_\_

Type of Antifreeze \_\_\_\_\_ Concentration of \_\_\_\_\_ Manufacturer of \_\_\_\_\_

Freeze Protection Manual ☐ Automatic ☐ Back up ☐

Freeze Protection Description

\_\_\_\_\_  
\_\_\_\_\_

High Point Vents Designed \_\_\_\_\_

\_\_\_\_\_

Low Point Drains Designed \_\_\_\_\_

Backup Heat    ☐ Boiler                      ☐ Instantaneous                      ☐ Standard Tank                      ☐ Combined Tank

OG-300 Rating \_\_\_\_\_

**Domestic Solar Water Heating systems will be rated by the SRCC and meet the OG-300 system standard. Systems that include OG-100 collectors, but are not certified under OG-300, will need to be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer detailing annual energy savings. Solar Space Heating systems will utilize OG-100 collectors.**

Horizontal Tilt Angle \_\_\_\_\_ Azimuth Angle \_\_\_\_\_ (+/- 60 degrees of due south)

Type of Mount \_\_\_\_\_ Roof (Must provide age of roof \_\_\_\_\_ yrs.) \_\_\_\_\_ Ground

Shading \_\_\_\_\_

Water Analysis Review Performed    ☐ Yes                      ☐ No

Cathodic ☐                                      Anodic ☐

Type of corrosion protection \_\_\_\_\_

Collector Manufacturer \_\_\_\_\_ Model \_\_\_\_\_ Quantity \_\_\_\_\_

Total Collector Area \_\_\_\_\_ Collector Material \_\_\_\_\_

Minimum collector wall thickness \_\_\_\_\_

Solar Storage Volume \_\_\_\_\_ Gallons

Heat Exchanger    ☐ Internal (Immersion)    ☐ Wrap around the tank    ☐ External    ☐ None

Total Cost \_\_\_\_\_ PV Cost \_\_\_\_\_ Labor Cost \_\_\_\_\_

Estimated Installation Date \_\_\_\_\_

**Reservation requests will include a manufacturer's verification disclosing that the system size and collector type proposed is appropriate for the specific application. The manufacturer's verification may be presented as a manufacturer's product specification sheet and will be included in the reservation request.**

### Warranty Information

**Contractors must provide a minimum of a five year equipment warranty as provided by the system manufacturer, including a minimum warranty period of five years for repair/replacement service to the customer.**

Collector \_\_\_\_\_ years                      Storage \_\_\_\_\_ years                      Pump \_\_\_\_\_ years                      Controller \_\_\_\_\_ years

Installation/Workmanship Warranty \_\_\_\_\_ years

### Rebate Calculation

(OG300 rating in annual kwh hours \_\_\_\_\_ x \$1,750) + \$1,750 = \_\_\_\_\_

### **Project Information**

Has a City/County Permit been secured? \_\_\_\_ Yes \_\_\_\_ No

### **System Qualifications**

The system must meet the requirements outlined in Attachment A of the Residential Solar Water – Space Heating Agreement.

Does this installation meet all ACC Interconnection/REST requirements?

### **Installer Information**

Company Name \_\_\_\_\_

Installer's Name \_\_\_\_\_

Business Address \_\_\_\_\_

Arizona Registrar of Contractors (AZROC) License Information

AZROC License Number \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

Contractor's License \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

### **Assignment of Payment**

I authorize UNS Electric, Inc. (UNS Electric) to issue, on my behalf, my full rebate to the following installer as payment toward the cost and/or installation of my PV system. I acknowledge that the payment made to the below named installer satisfies the financial obligation to me in connection with the Agreement signed by myself and UNS Electric.

Company Name \_\_\_\_\_

Contact Person \_\_\_\_\_

Business Address \_\_\_\_\_

Customer Signature \_\_\_\_\_ Date \_\_\_\_\_

### **Solar Water System Inspection Authorization**

Your system may be inspected annually through \_\_\_\_\_ to ensure it is operating efficiently and safely. Do you authorize UNS Electric to use a qualified third party contractor for your annual inspection?

Authorization Agreed ☐

Authorization Denied ☐

There are animals in the yard that the Program Inspector needs to be aware of: \_\_\_\_\_ Yes \_\_\_\_\_ No

**UNS ELECTRIC, INC.  
ON-GRID SMALL HYDRO APPLICATION**

**Customer Information**

Name (If Residential Application) \_\_\_\_\_  
Business Name (if Business Application) \_\_\_\_\_  
Mailing Address \_\_\_\_\_  
City \_\_\_\_\_, AZ Zip Code \_\_\_\_\_  
Street Address (if different from above) \_\_\_\_\_  
Daytime Phone Number \_\_\_\_\_  
E-mail Address \_\_\_\_\_  
Account Number \_\_\_\_\_  
Operating Agent if different from Customer \_\_\_\_\_

**Small Hydro System Information**

Generator Supplier Name \_\_\_\_\_  
Generator Manufacturer \_\_\_\_\_ Type \_\_\_\_\_  
Nameplate Output \_\_\_\_\_ Watts.  
System Warranty \_\_\_\_\_ Yrs (Copy of system warranty must be on file with UNS Electric, Inc.)  
Generator Warranty \_\_\_\_\_ Yrs (Copy of generator warranty must be on file with UNS Electric, Inc.)  
**The small hydro generator and system must be covered by a manufacturer's warranty of at least five years.**  
Equipment Cost \_\_\_\_\_ Labor Cost \_\_\_\_\_ Total Cost \_\_\_\_\_  
Estimated Installation Date \_\_\_\_\_

**Project Information**

Does this installation meet all ACC Interconnection/REST requirements?  
Has a City/County Permit been secured? \_\_\_\_\_ Yes \_\_\_\_\_ No

**System Qualifications**

The system must meet the requirements outlined in Attachment A of the Small Hydro Agreement.

## **Rebate Calculation**

### *PBI Calculation*

Estimated annual energy production of system \_\_\_\_\_ kwh x PBI amount \_\_\_\_\_ \$/kwh = \_\_\_\_\_ PBI

Will payment be assigned to the installer or dealer of the qualifying small hydro system? \_\_\_\_\_ Yes \_\_\_\_\_ No

## **Installer Information**

Company Name \_\_\_\_\_

Installer's Name \_\_\_\_\_

Business Address \_\_\_\_\_

Arizona Registrar of Contractors (AZROC) License Information

AZROC License Number \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

Contractor's License \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

## **Assignment of Payment**

I authorize UNS Electric, Inc. (UNS Electric) to issue, on my behalf, my full rebate to the following installer as payment toward the cost and/or installation of my system. I acknowledge that the payment made to the below named installer satisfies the financial obligation to me in connection with the Agreement signed by myself and UNS Electric.

Company Name \_\_\_\_\_

Contact Person \_\_\_\_\_

Business Address \_\_\_\_\_

Customer Signature \_\_\_\_\_ Date \_\_\_\_\_

## **Inspection Authorization**

The SunShare Program requires that your wind system generator be inspected annually to ensure it is operating efficiently and safely. Presently UNS Electric outsources all SunShare inspection services to a qualified third-party contractor. Do you authorize UNS Electric to use a qualified third party contractor for your annual inspection?

Authorization Agreed ☐      Authorization Denied ☐

There are animals in the yard that the Program Inspector needs to be aware of: \_\_\_\_\_ Yes \_\_\_\_\_ No

**UNS ELECTRIC, INC.  
SOLAR DAYLIGHTING APPLICATION**

**Customer Information**

Name (If Residential Application) \_\_\_\_\_  
Business Name (if Business Application) \_\_\_\_\_  
Mailing Address \_\_\_\_\_  
City \_\_\_\_\_, AZ Zip Code \_\_\_\_\_  
Street Address (if different from above) \_\_\_\_\_  
Daytime Phone Number \_\_\_\_\_  
E-mail Address \_\_\_\_\_  
Account Number \_\_\_\_\_  
Operating Agent if different from Customer \_\_\_\_\_

**Solar Daylighting System Information**

Equipment Supplier Name \_\_\_\_\_  
Equipment Manufacturer \_\_\_\_\_ Model Number \_\_\_\_\_  
Foot – Candles Rating at 36" above the floor \_\_\_\_\_  
Material and Labor Warranty \_\_\_\_\_ Yrs (Copy of material and labor warranty must be on file with UNS Electric, Inc.)  
**The material and labor must have warranty of at least five years.**  
Equipment Cost \_\_\_\_\_ Labor Cost \_\_\_\_\_ Total Cost \_\_\_\_\_  
Estimated Installation Date \_\_\_\_\_

**Project Information**

Energy and Designed Output Report Certification Provided \_\_\_\_ Yes \_\_\_\_ No  
Does this installation meet all ACC Interconnection/REST requirements?  
Has a City/County Permit been secured? \_\_\_\_ Yes \_\_\_\_ No

**System Qualifications**

The system must meet the requirements outlined in Attachment A of the Solar Daylighting Agreement.

## **Rebate Calculation**

*Extended UFI*

Annual Rebate Calculation: \$ \_\_\_\_\_ per kWh x Annual equivalent kWh saved = \_\_\_\_\_.

Will payment be assigned to the installer or dealer of the qualifying solar daylighting system? \_\_\_\_ Yes \_\_\_\_ No

## **Installer Information**

Company Name \_\_\_\_\_

Installer's Name \_\_\_\_\_

Business Address \_\_\_\_\_

Arizona Registrar of Contractors (AZROC) License Information

AZROC License Number \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

Contractor's License \_\_\_\_\_ Class \_\_\_\_\_ Expiration Date \_\_\_\_\_

## **Assignment of Payment**

I authorize UNS Electric, Inc. (UNS Electric) to issue, on my behalf, my full rebate to the following installer as payment toward the cost and/or installation of my system. I acknowledge that the payment made to the below named installer satisfies the financial obligation to me in connection with the Agreement signed by myself and UNS Electric.

Company Name \_\_\_\_\_

Contact Person \_\_\_\_\_

Business Address \_\_\_\_\_

Customer Signature \_\_\_\_\_ Date \_\_\_\_\_

## **Inspection Authorization**

The SunShare Program requires that daylighting system be inspected annually to ensure it is operating efficiently and safely. Presently UNS Electric outsources all SunShare inspection services to a qualified third-party contractor. Do you authorize UNS Electric to use a qualified third party contractor for your annual inspection?

Authorization Approved ☐ Authorization Denied ☐

There are animals in the yard that the Program Inspector needs to be aware of: \_\_\_\_ Yes \_\_\_\_ No





# Renewable Energy Credit Purchase Agreements

**UNS Electric, Inc.**  
**GreenWatts™ SunShare Program**  
**Extended Up Front Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**Solar Daylighting**

This GreenWatts™ SunShare Program Hardware Buydown Agreement (the “Agreement”) is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation (“Company”), and \_\_\_\_\_, (“Customer”). Company and Customer may be referred to individually herein as a “Party” or collectively as the “Parties.”

## RECITALS

A. Company desires to increase the number of renewable electricity generation facilities and the consumption of renewable energy within its service territory, while concurrently reducing the cost of renewable electric generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install renewable generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts™, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, \_\_\_\_\_, \_\_\_\_\_,  
Arizona, (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

## AGREEMENT

## 1. PROGRAM

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:

### 1.1 Renewable Energy System

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy

solar daylighting technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payment. Customer environmental credits and Company payments shall be based on the system capacity or estimated energy kWh production rather than on measured system output. This represents an Up Front Incentive ("UFI") payment method paid in five equal installments over five years starting with the year of successful operation and acceptance by Company.

## **2. SYSTEM INSTALLATION**

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A, including, without limitation, a proper interconnection with Company's existing power grid. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## **3. SYSTEM INSPECTION**

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## **4. SYSTEM ELECTRICAL OUTPUT**

Customer hereby assigns to Company all of its rights to reductions of energy consumption of the Customer System and all associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff Program (the "REST"), which may result from the installation and use of the Customer System. Company's right to Customer's power reduction and credits assigned hereunder shall continue until December 31<sup>st</sup> of the 20<sup>th</sup> full calendar year after completion of the installation of the Customer System and shall survive any termination of this Agreement.

## **5. RENEWABLE ENERGY CREDIT PURCHASE**

Program. Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall pay Customer \$\_\_\_\_\_ per annual AC kWh of professionally estimated energy reductions from solar daylighting of the Customer System for which completed Agreements are received and accepted by the Company and which system is operational within 180 days after application acceptance. These payments shall be made for four additional consecutive years on the anniversary of the first payment, for a total of five payments. The Customer System's AC kWh of installed solar daylighting energy reductions capacity shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System and successful

Customer System inspection. Any amounts determined to be owed under this section for the first year payment shall be paid by Company to Customer within 30 days following the Company's completion of AC kWh testing hereunder.

#### **6. RIGHTS FOR CREDITS**

Company shall have the right to the Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

#### **7. METER READING**

Once per year, typically in late December, during the term of this Agreement, Company shall review the Customer System solar daylighting energy reduction meter if applicable. Thus, Company reserves the right to read, at its option, the Customer System meter. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

#### **8. WARRANTY**

**COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.**

#### **9. LIMITATION OF LIABILITY**

**COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.**

#### **10. TERMINATION**

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within 30 days following written notice thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

#### **11. MISCELLANEOUS**

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof

shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1. Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by any Party without the prior written consent of Company.
- 11.2. Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3. Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4. Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5. Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6. Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7. Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.
- 11.8. Customer Sale of Facility. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer

shall be responsible for informing Company in writing of the transfer and such non-assumption.

- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:** **UNS Electric, Inc.**  
PO Box 3099  
Kingman, Arizona 86402  
Fax: (928) 681-8915  
Attn: Energy Services Department

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Annual Energy Reserved: \_\_\_\_\_ kWh**

**Estimated Five Year Funding Reserved: \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**

**Application Process**  
**ATTACHMENT A**  
**Solar Daylighting System Qualifications**

All solar daylighting generating Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. A roof mounted skylight assembly with a dome having a minimum 70% solar transmittance.
2. A reflective light well to the interior ceiling or a minimum 12" below roof deck in open bay areas.
3. An interior diffusion lens.
4. A minimum of one thermal break/dead air space in the system between the skylight dome and the interior diffuser.
5. If artificial lighting systems remain a part of the installation, the system shall include automated lighting control(s) which are programmed to keep electric lights off during daylight hours of sufficient solar insolation to provide minimum design illumination levels.
6. The system must provide a minimum of 70% of the light output of the artificial lighting system which would otherwise be used for all of the claimed period of energy savings as measured in foot-candles in the workspace 36 inches above the floor.
7. Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer or accredited AEE Measurement and Verification professional. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
8. The system will have a material and labor warranty of at least five years.
9. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code, including Article 690 and all grounding, conductor, raceway, overcurrent protection, disconnect and labeling requirements.



10. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code in effect in the jurisdiction where the installation is being completed (NEC).
11. Installation must have been made after January 1, 1997.
12. The Customer must be connected to the Company's electric grid.
13. All Customer System installations must be completed in a professional, workmanlike and safe manner.

**UNS Electric, Inc.**  
**GreenWatts<sup>TM</sup> SunShare Program**  
**Up Front Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**Off-Grid Residential Solar**

This GreenWatts<sup>TM</sup> SunShare Program Hardware Buydown Agreement (the "Agreement") is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS, Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer"). Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of solar electricity generation facilities and the consumption of solar electricity within its service territory, while concurrently reducing the cost of solar electric generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install solar generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts<sup>TM</sup>, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, at the address of \_\_\_\_\_, \_\_\_\_\_, Arizona (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:

**1.1 Renewable Energy System**

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy

off-grid residential solar technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payment. Customer environmental credits and Company payments shall be based on the system capacity or estimated energy kWh production rather than on measured system output. This represents a one time Up Front Incentive ("UFI") payment method.

## **2. SYSTEM INSTALLATION**

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A, Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## **3. SYSTEM INSPECTION**

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## **4. SYSTEM ELECTRICAL OUTPUT**

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and all associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff Program (the "REST"), which may result from the installation and use of the Customer System. Company will thereafter return any and all value of such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until December 31<sup>st</sup> of the 20<sup>th</sup> full calendar year after completion of the installation of the Customer System and shall survive any termination of this Agreement.

## **5. RENEWABLE ENERGY CREDIT PURCHASE**

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall pay Customer \$\_\_\_\_\_ per DC kW of installed off-grid residential solar generating capacity of the Customer System for which completed Agreements are received and accepted by the Company and which system is operational within 180 days after application acceptance, as prorated by any de-rating for off-angle and shading that may apply by the percentages listed on the chart in Attachment B. The Customer System's DC kW of installed off-grid residential solar generating capacity shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System, successful Customer System inspection and determination of the level of compliance with Attachment B. Any amounts determined to be

owed under this Section shall be paid by Company to Customer within 30 days following the Company's completion of AC kWh testing hereunder.

#### **6. RIGHTS FOR CREDITS**

Company shall have the right to the Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

#### **7. METER READING**

Once per year, typically in late December, during the term of this Agreement, Company shall read the Customer System solar production meter. Thus, Company reserves the right to read, at its option, the Customer System meter, if applicable. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

#### **8. WARRANTY**

**COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.**

#### **9. LIMITATION OF LIABILITY**

**COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.**

#### **10. TERMINATION**

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within 30 days following written notice thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

#### **11. MISCELLANEOUS**

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement

is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1. Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by any Party without the prior written consent of Company.
- 11.2. Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3. Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4. Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5. Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6. Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7. Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.
- 11.8. Customer Sale of Premises. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.

- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:** **UNS, Electric, Inc.**  
PO Box 3099  
Kingman, Arizona 86402  
Fax: (928) 681-8915  
Attn: Energy Services Department

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_.

**UNS, ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Capacity Reserved: \_\_\_\_\_ kW**

**Estimated Funding Reserved: \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**

**Application Process**  
**ATTACHMENT A**  
**Off-Grid Residential Solar System Qualifications**

All off-grid residential solar Customer Systems must meet the following system and installation requirements to qualify for UNS, Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. All systems shall be installed with a horizontal tilt angle between 10 degrees and 60 degrees, and an azimuth angle of +/- 100 degrees of due south. Installation configurations for some systems receiving a UFI will not be eligible for the full RECPP incentive. The reduction will be determined by the UNS Electric developed de-rating chart, Attachment B of this document, and as discussed further in this report under the section titled Conforming Project Incentives.
2. Qualifying systems using Building Integrated Photovoltaic (BIPV) modules of total array capacity of 5 kWDC or less shall receive 90% of the UFI incentive value for PV systems listed in Attachment A. Systems using BIPV module of total array capacity of greater than 5 kWDC shall only receive a PBI.
3. Photovoltaic modules must be covered by a manufacturer's warranty of at least 20 years.
4. Inverters must be covered by a manufacturer's warranty of at least ten years to receive a UFI and at least five years to receive a PBI.
5. The minimum PV array size shall be no less than 600 Wdc and the maximum PV array size shall not exceed 2,000 Wdc.
6. All photovoltaic modules must be certified by a nationally recognized testing laboratory as meeting the requirements of UL 1703.
7. Off-grid systems will not be metered. Compliance reporting production will be based on an annual 20% capacity factor using nameplate DC rating for capacity.
8. All other electrical components must be UL listed.
9. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code, including Article 690 and all grounding, conductor, raceway, overcurrent protection, disconnect and labeling requirements.
10. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official



having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code in effect in the jurisdiction where the installation is being completed (NEC), including, without limitation, Sections 200-6, 210-6, 230-70, 240-3, 250-26, 250-50, 250-122, all of Article 690 pertaining to Solar Photovoltaic Systems, thereof, all as amended and superseded.

11. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
12. The Customer System installation must meet the UNS Electric Service Requirements as follows:

"AN AC DISCONNECT MEANS SHALL BE PROVIDED IN AN AREA ACCESSIBLE AT ALL TIMES TO THE COMPANY ON ALL UNGROUNDED AC CONDUCTORS AND SHALL CONSIST OF A LOCKABLE GANG OPERATED DISCONNECT CLEARLY INDICATING OPEN OR CLOSED. THE SWITCH SHALL BE VISUALLY INSPECTED TO DETERMINE THAT IT IS OPEN. THE SWITCH SHALL BE CLEARLY LABELED "DG SERVICE DISCONNECT."

13. For Residential Customer Systems, Company will provide a meter and meter socket that will be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel.
14. Installation must have been made after January 1, 1997.
15. All Customer System installations must be completed in a professional, workmanlike and safe manner.

**UNS Electric, Inc.**  
**GreenWatts™ SunShare Program**  
**Up Front Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**Off-Grid Residential Wind**

This GreenWatts™ SunShare Program Hardware Buydown Agreement (the "Agreement") is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer"). Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of renewable electricity generation facilities and the consumption of renewable electricity within its service territory, while concurrently reducing the cost of renewable electric generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install renewable generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts™, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, at the address of \_\_\_\_\_, \_\_\_\_\_, Arizona (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:

**1.1 Renewable Energy System**

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy

off-grid residential wind technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payment. Customer environmental credits and Company payments shall be based on the system capacity or estimated energy kWh production rather than on measured system output. This represents a one time Up Front Incentive ("UFI") payment method.

## **2. SYSTEM INSTALLATION**

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A, Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## **3. SYSTEM INSPECTION**

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## **4. SYSTEM ELECTRICAL OUTPUT**

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and all associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff Program (the "REST"), which may result from the installation and use of the Customer System. Company will thereafter return any and all value of such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until December 31<sup>st</sup> of the 20<sup>th</sup> full calendar year after completion of the installation of the Customer System and shall survive any termination of this Agreement.

## **5. RENEWABLE ENERGY CREDIT PURCHASE**

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall pay Customer \$\_\_\_\_\_ per AC kW of installed off-grid residential wind generating capacity of the Customer System for which completed Agreements are received and accepted by the Company and which system is operational within 180 days after application acceptance. The Customer System's AC kW of installed off-grid residential wind generating capacity shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System and successful Customer System inspection. Any amounts determined to be owed under this Section shall be paid by Company to Customer within 30 days following the Company's completion of AC kWh testing hereunder.

## **6. RIGHTS FOR CREDITS**

Company shall have the right to the Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

## **7. METER READING**

Once per year, typically in late December, during the term of this Agreement, Company shall read the Customer System wind production meter, if applicable. Thus, Company reserves the right to read, at its option, the Customer System meter. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

## **8. WARRANTY**

**COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.**

## **9. LIMITATION OF LIABILITY**

**COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.**

## **10. TERMINATION**

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within 30 days following written notice thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

## **11. MISCELLANEOUS**

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1. Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by any Party without the prior written consent of Company.
- 11.2. Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3. Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4. Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5. Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6. Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7. Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.
- 11.8. Customer Sale of Premises. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.
- 11.9. Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or

by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:** **UNS Electric, Inc.**  
PO Box 3099  
Kingman, Arizona 86402  
Fax: (928) 681-8915  
Attn: Energy Services Department

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Capacity Reserved: \_\_\_\_\_kW**

**Estimated Funding Reserved: \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**

**Application Process**  
**ATTACHMENT A**  
**Off-grid Residential Wind System Qualifications**

All off-grid residential wind Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. Eligible small wind systems must be certified and nameplate rated by the CEC<sup>1</sup>. See [www.consumerenergycenter.org/erprebate/equipment.html](http://www.consumerenergycenter.org/erprebate/equipment.html) for a list of certified generators. For grid tied or off-grid wind generators where an inverter is used, the CEC listed nameplate rating of the wind generator will be multiplied by the CEC approved weighted efficiency percentage listed for the inverter in the "List of Eligible Inverters" at [www.consumerenergycenter.org/cgi-bin/eligible\\_inverters.cgi](http://www.consumerenergycenter.org/cgi-bin/eligible_inverters.cgi) to calculate the wind turbine nameplate rating for use in determining the UFI payment.
2. Off-grid systems of capacity less than 10 kWac will not be metered. Compliance reporting production will be based on an annual 20% capacity factor.
3. The tower used in the installation must be designed by an Arizona registered engineer and must be suitable for use with the wind generator. Tower installation must be designed and supervised by individuals familiar with local geotechnical conditions.
4. To receive a UFI, the wind generator and system must be covered by a manufacturer's warranty of at least ten years. Otherwise the system will qualify for a PBI. In all cases the wind system will have a material and labor warrantee of at least five years (see PBI Agreement).
5. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code, including Article 690 and all grounding, conductor, raceway, overcurrent protection, disconnect and labeling requirements.
6. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code in effect in the jurisdiction where the installation is being completed (NEC).
7. For Residential Customer Systems, Company will provide a meter and meter socket that will be installed in a readily accessible outdoor location by the Customer between the

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<sup>1</sup> UNS Electric recommends review of the SWCC standards for rating small wind generators once they become available for purposes of supplanting the CEC requirement in this Technology Criterion.



Customer System and the connection to the overcurrent device in the Customer's electric service panel. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel.

8. Energy storage devices are not allowed as part of the Customer System unless the energy storage device is a separate component and Company can locate the SunShare Meter, if applicable, at the Customer System's output.
9. Installation must have been made after January 1, 1997.
10. All Customer System installations must be completed in a professional, workmanlike and safe manner.

**UNS Electric, Inc.**  
**GreenWatts<sup>TM</sup> SunShare Program**  
**Up Front Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**On-Grid Non-Residential Solar**  
**20 kW or less**

This GreenWatts<sup>TM</sup> SunShare Program Hardware Buydown Agreement (the "Agreement") is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer"). Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of solar electricity generation facilities and the consumption of solar electricity within its service territory, while concurrently reducing the cost of solar electric generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install solar generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts<sup>TM</sup>, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, at the address of \_\_\_\_\_, \_\_\_\_\_, Arizona (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:

**1.1 Renewable Energy System**

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy

on-grid non-residential solar technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payment. Customer environmental credits and Company payments shall be based on the system capacity or estimated energy kWh production rather than on measured system output. This represents a one time Up Front Incentive ("UFI") payment method.

## **2. SYSTEM INSTALLATION**

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A, including, without limitation, a proper interconnection with Company's existing power grid. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## **3. SYSTEM INSPECTION**

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## **4. SYSTEM ELECTRICAL OUTPUT**

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and all associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff Program (the "REST"), which may result from the installation and use of the Customer System. Company will thereafter return any and all value of such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until December 31<sup>st</sup> of the 20<sup>th</sup> full calendar year after completion of the installation of the Customer System and shall survive any termination of this Agreement.

## **5. RENEWABLE ENERGY CREDIT PURCHASE**

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall pay Customer \$\_\_\_\_\_ per DC kW of installed on-Grid non-residential solar generating capacity of the Customer System for which completed Agreements are received and accepted by the Company and which system is operational within 180 days after application acceptance, as prorated by any de-rating for off-angle and shading that may apply by the percentages listed on the chart in Attachment B. The Customer System's DC kW of installed on-grid non-residential solar generating capacity shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System, successful Customer System inspection and determination of the level of compliance with Attachment B. Any amounts determined to be

owed under this Section shall be paid by Company to Customer within 30 days following the Company's completion of AC kWh testing hereunder.

#### **6. RIGHTS FOR CREDITS**

Company shall have the right to the Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

#### **7. METER READING**

Once per year, typically in late December, during the term of this Agreement, Company shall read the Customer System solar production meter. Thus, Company reserves the right to read, at its option, the Customer System meter. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

#### **8. WARRANTY**

**COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.**

#### **9. LIMITATION OF LIABILITY**

**COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.**

#### **10. TERMINATION**

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within 30 days following written notice thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

#### **11. MISCELLANEOUS**

**Modification, Waiver and Severability.** This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1. **Assignment.** This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by any Party without the prior written consent of Company.

- 11.2. Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3. Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4. Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5. Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6. Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7. Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.
- 11.8. Customer Sale of Facility. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.
- 11.9. Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:**

**UNS Electric, Inc.**

PO Box 3099

Kingman, Arizona 86402

Fax: (928) 681-8915

Attn: Energy Services Department

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Capacity Reserved: \_\_\_\_\_kW**

**Estimated Funding Reserved: \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**

**Application Process**  
**ATTACHMENT A**  
**On-Grid Non-Residential Solar System Qualifications**

All on-grid non-residential solar Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. All systems shall be installed with a horizontal tilt angle between 10 degrees and 60 degrees, and an azimuth angle of +/- 100 degrees of due south. Installation configurations for some systems receiving a UFI will not be eligible for the full RECPP incentive. The reduction will be determined by the UNS Electric developed de-rating chart, Attachment B of this document, and as discussed further in this report under the section titled Conforming Project Incentives.
2. Qualifying systems using Building Integrated Photovoltaic (BIPV) modules of total array capacity of 5 kWDC or less shall receive 90% of the UFI incentive value for PV systems listed in Attachment A. Systems using BIPV module of total array capacity of greater than 5 kWDC shall only receive a PBI (see PBI Agreement).
3. Photovoltaic modules must be covered by a manufacturer's warranty of at least 20 years.
4. Inverters must be covered by a manufacturer's warranty of at least ten years to receive a UFI and at least five years to receive a PBI (see PBI Agreement).
5. The minimum PV array size shall be no less than 1,200 Wdc
6. All photovoltaic modules must be certified by a nationally recognized testing laboratory as meeting the requirements of UL Standard 1703.
7. All other electrical components must be UL listed.
8. The inverter must be certified as meeting the requirements of IEEE-1547 - Recommended Practice for Utility Interface of Photovoltaic Systems and it must be UL 1741 certified.
9. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code, including Article 690 and all grounding, conductor, raceway, overcurrent protection, disconnect and labeling requirements.
10. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code in effect in the jurisdiction



where the installation is being completed (NEC), including, without limitation, Sections 200-6, 210-6, 230-70, 240-3, 250-26, 250-50, 250-122, all of Article 690 pertaining to Solar Photovoltaic Systems, thereof, all as amended and superseded.

11. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
12. The Customer System installation must meet the UNS Electric Service Requirements as follows:

"AN AC DISCONNECT MEANS SHALL BE PROVIDED IN AN AREA ACCESSIBLE AT ALL TIMES TO THE COMPANY ON ALL UNGROUNDED AC CONDUCTORS AND SHALL CONSIST OF A LOCKABLE GANG OPERATED DISCONNECT CLEARLY INDICATING OPEN OR CLOSED. THE SWITCH SHALL BE VISUALLY INSPECTED TO DETERMINE THAT IT IS OPEN. THE SWITCH SHALL BE CLEARLY LABELED "DG SERVICE DISCONNECT."

13. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel.
14. Energy storage devices are not allowed as part of the Customer System unless the energy storage charge controller is a separate component and Company can locate the SunShare Meter at the Customer System's inverter output. Other types of qualified energy storage devices meet PBI requirements (see PBI Agreement).
15. Installation must have been made after January 1, 1997.
16. The Customer must be connected to the Company's electric grid.
17. All Customer System installations must be completed in a professional, workmanlike and safe manner.

ATTACHMENT B  
SunShare PV Off-Angle & Shading Annual Energy Derating Chart

# SunShare PV Off-Angle & Shading Annual Energy Derating Chart

Revised 09/05/2003

Array Azimuth Angle from Due South

A	EAST										SOUTH										WEST										A
	100	80	60	40	20	20	40	60	80	100	100	80	60	40	20	20	40	60	80	100											
10	75%	80%	85%	85%	85%	85%	85%	80%	80%	80%																					
15	90%	90%	95%	95%	95%	95%	95%	90%	90%	85%																					
20																															
25	85%	90%	95%	95%	100%	95%	95%	90%	90%	85%																					
30	85%	90%	95%	95%	100%	95%	95%	90%	85%	80%																					
35	80%	85%	90%	95%	100%	95%	95%	90%	80%	75%																					
40	75%	85%	90%	95%	95%	95%	90%	85%	80%	70%																					
45	75%	85%	90%	95%	95%	95%	90%	85%	75%	70%																					
50	70%	80%	85%	95%	95%	90%	80%	75%	70%	65%																					
55	70%	80%	85%	90%	90%	85%	80%	70%	60%																						
60	65%	75%	80%	90%	90%	85%	75%	70%	60%																						

Array Azimuth Angle from Due South

If both off angle and shading conditions apply, multiply the off angle derating factor with the shading derating factor to obtain the array derating factor for the SunShare payment calculation.

Maximum Morning Shaded Hours	0	1	0	1	0	2	1	2	2	0	3	1	3	3	2
Maximum Evening Shaded Hours	0	0	1	1	2	0	2	1	2	3	0	3	1	2	3
Percentage of Annual Energy =	100%	100%	100%	95%	90%	90%	85%	85%	75%	75%	70%	70%	70%	60%	60%

**UNS Electric, Inc.**  
**GreenWatts™ SunShare Program**  
**Up Front Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**On-Grid Residential Solar**

This GreenWatts™ SunShare Program Hardware Buydown Agreement (the "Agreement") is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer"). Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of solar electricity generation facilities and the consumption of solar electricity within its service territory, while concurrently reducing the cost of solar electric generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install solar generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts™, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, at the address of \_\_\_\_\_, \_\_\_\_\_, Arizona (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:

**1.1 Renewable Energy System**

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy

on-grid residential solar technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payment. Customer environmental credits and Company payments shall be based on the system capacity or estimated energy kWh production rather than on measured system output. This represents a one time Up Front Incentive ("UFI") payment method.

## **2. SYSTEM INSTALLATION**

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A, including, without limitation, a proper interconnection with Company's existing power grid. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## **3. SYSTEM INSPECTION**

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## **4. SYSTEM ELECTRICAL OUTPUT**

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and all associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff Program (the "REST"), which may result from the installation and use of the Customer System. Company will thereafter return any and all value of such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until December 31<sup>st</sup> of the 20<sup>th</sup> full calendar year after completion of the installation of the Customer System and shall survive any termination of this Agreement.

## **5. RENEWABLE ENERGY CREDIT PURCHASE**

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall pay Customer \$\_\_\_\_\_ per DC kW of installed on-grid residential solar generating capacity of the Customer System for which completed Agreements are received and accepted by the Company and which system is operational within 180 days after application acceptance, as prorated by any de-rating for off-angle and shading that may apply by the percentages listed on the chart in Attachment B. The Customer System's DC kW of installed on-grid residential solar generating capacity shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System, successful Customer System inspection and

determination of the level of compliance with Attachment B. Any amounts determined to be owed under this Section shall be paid by Company to Customer within 30 days following the Company's completion of AC kWh testing hereunder.

#### **6. RIGHTS FOR CREDITS**

Company shall have the right to the Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

#### **7. METER READING**

Once per year, typically in late December, during the term of this Agreement, Company shall read the Customer System solar production meter. Thus, Company reserves the right to read, at its option, the Customer System meter. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

#### **8. WARRANTY**

**COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.**

#### **9. LIMITATION OF LIABILITY**

**COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.**

#### **10. TERMINATION**

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within 30 days following written notice thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

#### **11. MISCELLANEOUS**

**Modification, Waiver and Severability.** This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.



- 11.1. Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by any Party without the prior written consent of Company.
- 11.2. Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3. Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4. Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5. Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6. Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7. Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.
- 11.8. Customer Sale of Premises. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.

- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:** **UNS Electric, Inc.**  
PO Box 3099  
Kingman, Arizona 86402  
Fax: (928) 681-8915  
Attn: Energy Services Department

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Capacity Reserved: \_\_\_\_\_ kW**

**Estimated Funding Reserved: \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**



**Application Process**  
**ATTACHMENT A**  
**On-Grid Residential Solar System Qualifications**

All on-grid residential solar Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. All systems shall be installed with a horizontal tilt angle between 10 degrees and 60 degrees, and an azimuth angle of +/- 100 degrees of due south. Installation configurations for some systems receiving a UFI will not be eligible for the full RECPP incentive. The reduction will be determined by the UNS Electric developed de-rating chart, Attachment B of this document, and as discussed further in this report under the section titled Conforming Project Incentives.
2. Qualifying systems using Building Integrated Photovoltaic (BIPV) modules of total array capacity of 5 kWDC or less shall receive 90% of the UFI incentive value for PV systems listed in Attachment A. Systems using BIPV module of total array capacity of greater than 5 kWDC shall only receive a PBI (see on-grid residential PBI Agreement).
3. Photovoltaic modules must be covered by a manufacturer's warranty of at least 20 years.
4. Inverters must be covered by a manufacturer's warranty of at least ten years to receive a UFI and at least five years to receive a PBI (see on-grid residential PBI Agreement).
5. The minimum PV array size shall be no less than 1,200 Wdc.
6. All photovoltaic modules must be certified by a nationally recognized testing laboratory as meeting the requirements of UL Standard 1703.
7. All other electrical components must be UL listed.
8. The inverter must be certified as meeting the requirements of IEEE-1547 - Recommended Practice for Utility Interface of Photovoltaic Systems and it must be UL 1741 certified.
9. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code, including Article 690 and all grounding, conductor, raceway, overcurrent protection, disconnect and labeling requirements.
10. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code in effect in the jurisdiction where the installation is being completed (NEC), including, without limitation, Sections

200-6, 210-6, 230-70, 240-3, 250-26, 250-50, 250-122, all of Article 690 pertaining to Solar Photovoltaic Systems, thereof, all as amended and superseded.

11. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
12. The Customer System installation must meet the UNS Electric Service Requirements as follows:

"AN AC DISCONNECT MEANS SHALL BE PROVIDED IN AN AREA ACCESSIBLE AT ALL TIMES TO THE COMPANY ON ALL UNGROUNDED AC CONDUCTORS AND SHALL CONSIST OF A LOCKABLE GANG OPERATED DISCONNECT CLEARLY INDICATING OPEN OR CLOSED. THE SWITCH SHALL BE VISUALLY INSPECTED TO DETERMINE THAT IT IS OPEN. THE SWITCH SHALL BE CLEARLY LABELED "DG SERVICE DISCONNECT."

13. For Residential Customer Systems, Company will provide a meter and meter socket that will be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel.
14. Energy storage devices are not allowed as part of the Customer System unless the energy storage charge controller is a separate component and Company can locate the SunShare Meter at the Customer System's inverter output. Other types of qualified energy storage devices meet PBI requirements (see PBI Agreement).
15. Installation must have been made after January 1, 1997.
16. The Customer must be connected to the Company's electric grid.
17. All Customer System installations must be completed in a professional, workmanlike and safe manner.

ATTACHMENT B  
SunShare PV Off-Angle & Shading Annual Energy Derating Chart

# SunShare PV Off-Angle & Shading Annual Energy Derating Chart

Revised 09/05/2003

Array Azimuth Angle from Due South

Array Angle above Horizontal	EAST								SOUTH								WEST								Array Angle above Horizontal
	100	80	60	40	20	20	40	60	80	100	100	80	60	40	20	20	40	60	80	100					
10	75%	80%	85%	85%	85%	85%	85%	80%	80%	80%	80%	80%	85%	90%	95%	95%	95%	95%	90%	85%	75%				
15	90%	90%	95%	95%	95%	95%	95%	90%	90%	85%	85%	85%	90%	95%	95%	95%	95%	90%	85%	75%					
20	85%	90%	95%	95%	100%	95%	95%	90%	90%	85%	85%	85%	90%	95%	95%	95%	95%	90%	85%	75%					
25	85%	90%	95%	95%	100%	95%	95%	90%	85%	80%	80%	80%	85%	90%	95%	95%	95%	90%	85%	75%					
30	80%	85%	90%	95%	100%	95%	95%	90%	80%	75%	75%	75%	80%	85%	90%	95%	95%	90%	80%	70%					
35	75%	85%	90%	95%	95%	95%	90%	85%	80%	75%	75%	75%	80%	85%	90%	95%	95%	90%	80%	70%					
40	75%	85%	90%	95%	95%	95%	90%	85%	80%	75%	75%	75%	80%	85%	90%	95%	95%	90%	80%	70%					
45	70%	80%	85%	95%	95%	95%	90%	80%	75%	70%	70%	70%	75%	80%	85%	90%	95%	90%	80%	65%					
50	70%	80%	85%	90%	90%	90%	85%	80%	70%	65%	65%	65%	70%	75%	80%	85%	90%	90%	80%	60%					
55	65%	75%	80%	90%	90%	90%	85%	75%	70%	60%	60%	60%	70%	75%	80%	85%	90%	90%	80%	60%					
60																									

above horizontal	Array Azimuth Angle from Due South																Array Horizontal
	EAST								WEST								
	100	80	60	40	20	20	40	60	80	100							

If both off angle and shading conditions apply, multiply the off angle derating factor with the shading derating factor to obtain the array derating factor for the SunShare payment calculation.

Maximum Morning Shaded Hours	0	1	0	1	0	2	1	2	2	0	3	1	3	3	2	
Maximum Evening Shaded Hours	0	0	1	1	2	0	2	1	2	3	0	3	1	2	3	
Percentage of Annual Energy =	100%	100%	100%	95%	90%	90%	85%	85%	75%	75%	70%	70%	70%	60%	60%	



**UNS Electric, Inc.**  
**GreenWatts™ SunShare Program**  
**Up Front Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**On-Grid Residential Wind**

This GreenWatts™ SunShare Program Hardware Buydown Agreement (the "Agreement") is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer"). Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of renewable electricity generation facilities and the consumption of renewable electricity within its service territory, while concurrently reducing the cost of renewable electric generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install renewable generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts™, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, at the address of \_\_\_\_\_, \_\_\_\_\_, Arizona (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:

**1.1 Renewable Energy System**

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy

on-grid residential wind technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payment. Customer environmental credits and Company payments shall be based on the system capacity or estimated energy kWh production rather than on measured system output. This represents a one time Up Front Incentive ("UFI") payment method.

## **2. SYSTEM INSTALLATION**

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A, including, without limitation, a proper interconnection with Company's existing power grid. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## **3. SYSTEM INSPECTION**

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## **4. SYSTEM ELECTRICAL OUTPUT**

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and all associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff Program (the "REST"), which may result from the installation and use of the Customer System. Company will thereafter return any and all value of such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until December 31<sup>st</sup> of the 20<sup>th</sup> full calendar year after completion of the installation of the Customer System and shall survive any termination of this Agreement.

## **5. RENEWABLE ENERGY CREDIT PURCHASE**

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall pay Customer \$\_\_\_\_\_ per AC kW of installed on-grid residential wind generating capacity of the Customer System for which completed Agreements are received and accepted by the Company and which system is operational within 180 days after application acceptance. The Customer System's AC kW of installed on-grid residential wind generating capacity shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System and successful Customer System inspection. Any amounts determined to be owed under this

Section shall be paid by Company to Customer within 30 days following the Company's completion of AC kWh testing hereunder.

**6. RIGHTS FOR CREDITS**

Company shall have the right to the Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

**7. METER READING**

Once per year, typically in late December, during the term of this Agreement, Company shall read the Customer System wind production meter. Thus, Company reserves the right to read, at its option, the Customer System meter. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

**8. WARRANTY**

COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.

**9. LIMITATION OF LIABILITY**

COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.

**10. TERMINATION**

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within 30 days following written notice thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

**11. MISCELLANEOUS**

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement

is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1. Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by any Party without the prior written consent of Company.
- 11.2. Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3. Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4. Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5. Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6. Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7. Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.
- 11.8. Customer Sale of Premises. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer

shall be responsible for informing Company in writing of the transfer and such non-assumption.

- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:** **UNS Electric, Inc.**  
PO Box 3099  
Kingman, Arizona 86402  
Fax: (928) 681-8915  
Attn: Energy Services Department

*[signatures on following page]*



IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed as of \_\_\_\_\_, 20\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Capacity Reserved: \_\_\_\_\_kW**

**Estimated Funding Reserved: \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**

**Application Process**  
**ATTACHMENT A**  
**On-Grid Residential Wind System Qualifications**

All on-grid residential wind Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. Eligible small wind systems must be certified and nameplate rated by the CEC<sup>1</sup>. See [www.consumerenergycenter.org/erprebate/equipment.html](http://www.consumerenergycenter.org/erprebate/equipment.html) for a list of certified generators. For grid tied or off-grid wind generators where an inverter is used, the CEC listed nameplate rating of the wind generator will be multiplied by the CEC approved weighted efficiency percentage listed for the inverter in the "List of Eligible Inverters" at [www.consumerenergycenter.org/cgi-bin/eligible\\_inverters.cgi](http://www.consumerenergycenter.org/cgi-bin/eligible_inverters.cgi) to calculate the wind turbine nameplate rating for use in determining the UFI payment.
2. Grid connected inverters used as part of the system shall carry a UL listing certifying full compliance with Underwriter's Laboratory ("UL")-1741.
3. The tower used in the installation must be designed by an Arizona registered engineer and must be suitable for use with the wind generator. Tower installation must be designed and supervised by individuals familiar with local geotechnical conditions.
4. To receive a UFI, the wind generator and system must be covered by a manufacturer's warranty of at least ten years. Otherwise the system will qualify for a PBI. In all cases the wind system will have a material and labor warrantee of at least five years.
5. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code, including Article 690 and all grounding, conductor, raceway, overcurrent protection, disconnect and labeling requirements.
6. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code in effect in the jurisdiction where the installation is being completed (NEC).
7. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.

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<sup>1</sup> UNS ELECTRIC recommends review of the SWCC standards for rating small wind generators once they become available for purposes of supplanting the CEC requirement in this Technology Criterion.

8. The Customer System installation must meet the UNS Electric Service Requirements as follows:

"AN AC DISCONNECT MEANS SHALL BE PROVIDED IN AN AREA ACCESSIBLE AT ALL TIMES TO THE COMPANY ON ALL UNGROUNDED AC CONDUCTORS AND SHALL CONSIST OF A LOCKABLE GANG OPERATED DISCONNECT CLEARLY INDICATING OPEN OR CLOSED. THE SWITCH SHALL BE VISUALLY INSPECTED TO DETERMINE THAT IT IS OPEN. THE SWITCH SHALL BE CLEARLY LABELED "DG SERVICE DISCONNECT."

9. For Residential Customer Systems, Company will provide a meter and meter socket that will be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel.
10. Energy storage devices are not allowed as part of the Customer System unless the energy storage device is a separate component and Company can locate the SunShare Meter at the Customer System's output.
11. Installation must have been made after January 1, 1997.
12. The Customer must be connected to the Company's electric grid.
13. All Customer System installations must be completed in a professional, workmanlike and safe manner.

**UNS Electric, Inc.**  
**GreenWatts™ SunShare Program**  
**Up Front Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**On Grid Residential Solar Water - Space Heating**

This GreenWatts™ SunShare Program Hardware Buydown Agreement (the "Agreement") is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer"). Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of solar thermal facilities and the consumption of solar energy within its service territory, while concurrently reducing the cost of solar thermal systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install solar energy equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts™, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, at the address of \_\_\_\_\_, \_\_\_\_\_, Arizona (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:

**1.1 Renewable Energy System**

1.1.1 System. Customer shall purchase a renewable energy system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy on grid

solar water – space heating technology specific requirements set forth in Attachment A “System Qualifications”, which is attached hereto and incorporated herein.

1.1.2 Basis of Payment. Customer environmental credits and Company payments shall be based on the system capacity or estimated energy kWh production rather than on measured system output. This represents a one time Up Front Incentive (“UFI”) payment method.

## **2. SYSTEM INSTALLATION**

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## **3. SYSTEM INSPECTION**

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## **4. SYSTEM ELECTRICAL OUTPUT**

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and all associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff Program (the “REST”), which may result from the installation and use of the Customer System. Company will thereafter return any and all value of such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until December 31<sup>st</sup> of the 20<sup>th</sup> full calendar year after completion of the installation of the Customer System and shall survive any termination of this Agreement.

## **5. RENEWABLE ENERGY CREDIT PURCHASE**

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall pay Customer \$\_\_\_\_\_ for on grid solar water - space heating for the Customer System for which completed Agreements are received and accepted by the Company and which system is operational within 180 days after application acceptance. The Customer System's energy production installed on grid solar water – space heating generating capacity shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System and successful Customer System inspection. Any amounts determined to be owed under this Section shall be paid by Company to Customer within 30 days following the Company's completion of AC kWh testing hereunder.

## **6. RIGHTS FOR CREDITS**

Company shall have the right to the Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

## **7. WARRANTY**

**COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.**

## **8. LIMITATION OF LIABILITY**

**COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.**

## **9. TERMINATION**

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within 30 days following written notice thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

## **10. MISCELLANEOUS**

**Modification, Waiver and Severability.** This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

10.1. **Assignment.** This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by any Party without the prior written consent of Company.

10.2. **Governing Law and Venue.** This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for

any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.

- 10.3. Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 10.4. Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 10.5. Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 10.6. Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 10.7. Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.
- 10.8. Customer Sale of Premises. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.
- 10.9. Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:**

**UNS Electric, Inc.**

PO Box 3099

Kingman, Arizona 86402

Fax: (928) 681-8915

Attn: Energy Services Department

***[signatures on following page]***



IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed as of \_\_\_\_\_, 20\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Capacity Reserved: \_\_\_\_\_ kW**

**Estimated Funding Reserved: \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**

**Application Process**  
**ATTACHMENT A**  
**On Grid Solar Water – Space Heating System Qualifications**

All on grid solar water – space heating Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., (“UNS Electric” or the “Company”) GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. Domestic Solar Water Heating systems will be rated by the SRCC and meet the OG-300 system standard. Systems that include OG-100 collectors, but are not certified under OG-300, will need to be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer detailing annual energy savings. Solar Space Heating systems will utilize OG-100 collectors.
2. Domestic Water Heating systems shall be selected and sized according to the geographic location and hot water needs of the specific application. Reservation requests will include a manufacturer’s verification disclosing that the system size and collector type proposed is appropriate for the specific application, including certification that collector stagnation temperature shall never exceed 300 degrees Fahrenheit under any possible conditions at the location of the installation. The manufacturer’s verification may be presented as a manufacturer’s product specification sheet and will be included in the reservation request. Compliance reporting production will be based on the design energy savings submitted at time of application.
3. Solar Space Heating systems will be sized in conformance with the Solar Space Heating Incentive Calculation Procedure (Attachment E.) Compliance reporting production will be based on the design energy savings submitted at time of application.
4. Active, open-loop systems are not eligible for UCPP incentives except for active, open-loop systems that have a proven technology or design that limits scaling and internal corrosion of system piping, and includes appropriate automatic methods for freeze protection and prevents stagnations temperatures that exceed 250 degrees F. under all conditions at the location of installation. Details disclosing conformance with this exception shall be submitted as part of the manufacturer’s verification documentation.
5. Integrated Collector System (ICS) systems shall have a minimum collector piping wall thickness of 0.058 inches. Details disclosing conformance with this requirement shall be submitted as part of the manufacturer’s verification documentation. ICS units shall include certification that collector stagnation temperature shall never exceed 250 degrees F. under any possible conditions at the location of the installation.
6. The ‘high’ limit on all Domestic Water Heating controllers shall be set no higher than 160 degrees F.

7. Active thermal storage for solar space heating systems shall use water as the storage element.
8. Contractors must provide a minimum of a five year equipment warranty as provided by the system manufacturer, including a minimum warranty period of five years for repair/replacement service to the customer.
9. The solar collector, heat exchangers and storage elements shall have an equipment warranty of at least 10 years to qualify for a UFI.
10. The system shall be installed with a horizontal tilt angle between 20 degrees and 60 degrees (30 and 60 degrees for space heating applications), and an azimuth angle of +/- 60 degrees of due south (+/- 45 degrees for space heating applications). It is recommended that collectors be positioned for optimum winter heating conditions at a minimum tilt angle of 45 degrees above horizontal, or as recommended by the manufacturer for the specific collector type and geographic location of installation.
11. All systems should be installed such that the energy collection system is substantially unshaded and should have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.
12. Heat exchange fluid in glycol systems should be tested, flushed and refilled with new fluid as necessary or at a minimum every five years or sooner per manufacturer's recommendations.
13. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Plumbing Code.
14. Installation must have been made after January 1, 1997.
15. The Customer must be connected to the Company's electric grid.
16. All Customer System installations must be completed in a professional, workmanlike and safe manner.

**UNS Electric, Inc.**  
**GreenWatts<sup>TM</sup> SunShare Program**  
**Performance Based Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**Solar Space Cooling**

This GreenWatts<sup>TM</sup> SunShare Performance Based Incentive (PBI) Program Renewable Energy Credit Purchase Agreement (the "Agreement") is hereby made and entered into this

\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer").

Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of renewable electricity generation facilities and the consumption of renewable electricity within its service territory, while concurrently reducing the cost of renewable electric generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install renewable generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts<sup>TM</sup>, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, \_\_\_\_\_, \_\_\_\_\_, Arizona (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM:**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:

## 1.1 Renewable Energy System

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy solar space cooling technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payments. Customer environmental credits and Company payments shall be based on the actual metered renewable energy production as explained in Section 5 below. This represents a Performance Based Incentive payment method.

## 2. SYSTEM INSTALLATION

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## 3. SYSTEM INSPECTION

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## 4. SYSTEM ELECTRICAL OUTPUT

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and, upon receipt of payment by the Company for the Performance Based Incentive based on actual energy generated from the installation and use of the Customer System, assigns by operation of this Agreement all resultant associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff (REST) program (the "Renewable Energy Credits"). Company will thereafter return any and all value of such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until the last day of the month of \_\_\_\_\_ in 20\_\_\_\_ and shall survive any termination of this Agreement.

## 5. RENEWABLE ENERGY CREDIT PURCHASE

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall no more frequently than monthly, nor less frequently than annually, pay to Customer \$0.\_\_\_\_\_ per metered AC kilowatt-hour of net renewable energy production from

the Customer System installed under this Agreement, provided that said System is operational within 180 days after execution of this Agreement. Payment shall not be for less than \$25.00 unless a full twelve (12) months has elapsed since the last such payment. All such payments shall be made by Company within thirty (30) days of the end of each calendar month in which energy is generated by the Customer System and received by Company. The Customer System's first payment shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System, and a successful Customer System inspection pursuant to Section 3 above. Energy for payment will be calculated at one kW-hr per ton of metered cooling for systems with capacity of 100 tons or less and one kW-hr per 1.33 tons for systems with a capacity of greater than 100 tons as recorded on the cooling energy meter installed as part of the Customer System.

#### **6. RIGHTS FOR CREDITS**

Company shall have the right to purchase Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

#### **7. METER READING**

No more often than once per month nor less often than once per year during the term of this Agreement, Company shall read the Customer System renewable energy production meter for purpose of determining the payment amount per Section 5 above. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

#### **8. WARRANTY**

**COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.**

#### **9. LIMITATION OF LIABILITY**

**COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.**

## 10. TERMINATION

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within thirty (30) days following written notice thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

## 11. MISCELLANEOUS

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1 Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by the Customer without the prior written consent of Company.
- 11.2 Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3 Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4 Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5 Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6 Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7 Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.

- 11.8 Customer Sale of Residence. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.
- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:** **UNS Electric, Inc.**  
PO Box 3099  
Kingman, Arizona 86402  
Fax: (928) 681-8915  
Attn: Energy Services Department

***[signatures on following page]***



IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Annual Energy Reserved: \_\_\_\_\_ KWh**

**Estimated Annual Payment \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**

**Application Process**  
**ATTACHMENT A**  
**Solar Space Cooling System Qualifications**

All solar space cooling Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. The minimum cooling capacity of the system will be 120,000 BTU (10 tons) per hour.
2. Solar collector panels used will have a Solar Rating and Certification Corporation ("SRCC") OG-100 rating or laboratory documentation showing the panel energy output under controlled and replicable test conditions.
3. Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
4. System must include a dedicated performance meter to allow for monitoring of the amount of useful cooling produced. As an exception to the REST Rule R14-2-1803.B, energy production will be calculated at one kW-hr per ton of metered cooling for systems with capacity of 100 tons or less and one kW-hr per 1.33 tons for systems with a capacity of greater than 100 tons.
5. The system will have a material and labor warranty of at least five years.
6. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code, including Article 690 and all grounding, conductor, raceway, overcurrent protection, disconnect and labeling requirements.
7. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code in effect in the jurisdiction where the installation is being completed (NEC), including, without limitation, Sections 200-6, 210-6, 230-70, 240-3, 250-26, 250-50, 250-122, all of Article 690 pertaining to Solar Photovoltaic Systems, thereof, all as amended and superseded.
8. Installation must have been made after January 1, 1997.
9. All Customer System installations must be completed in a professional, workmanlike and safe manner.

**UNS Electric, Inc.**  
**GreenWatts™ SunShare Program**  
**Performance Based Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**Biomass/Biogas (Cooling)**

This GreenWatts™ SunShare Performance Based Incentive (PBI) Program Renewable Energy Credit Purchase Agreement (the "Agreement") is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer"). Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of renewable generation facilities and the consumption of renewable electricity within its service territory, while concurrently reducing the cost of renewable generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install renewable generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts™, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, \_\_\_\_\_ Arizona (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM:**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:

## 1.1 Renewable Energy System

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy biomass/biogas (cooling) generation technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payments. Customer environmental credits and Company payments shall be based on the actual metered renewable energy production as explained in Section 5 below. This represents a Performance Based Incentive payment method.

## 2. SYSTEM INSTALLATION

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## 3. SYSTEM INSPECTION

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## 4. SYSTEM ELECTRICAL OUTPUT

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and, upon receipt of payment by the Company for the Performance Based Incentive based on actual energy generated from the installation and use of the Customer System, assigns by operation of this Agreement all resultant associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff (REST) program (the "Renewable Energy Credits"). Company will thereafter return any and all value of such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until the last day of the month of \_\_\_\_\_ in 20\_\_\_\_ and shall survive any termination of this Agreement.

## 5. RENEWABLE ENERGY CREDIT PURCHASE

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall no more frequently than monthly, nor less frequently than annually, pay to Customer \$0.\_\_\_\_\_ per metered AC kilowatt-hour of net renewable energy production from

the Customer System installed under this Agreement, provided that said System is operational within 180 days after execution of this Agreement. Payment shall not be for less than \$25.00 unless a full twelve (12) months has elapsed since the last such payment. All such payments shall be made by Company within thirty (30) days of the end of each calendar month in which energy is generated by the Customer System and received by Company. The Customer System's first payment shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System, and a successful Customer System inspection pursuant to Section 3 above. Energy for payment will be calculated at one kW-hr per ton of metered cooling for systems with capacity of 100 tons or less and one kW-hr per 1.33 tons for systems with a capacity of greater than 100 tons as recorded on the cooling energy meter installed as part of the Customer System.

#### **6. RIGHTS FOR CREDITS**

Company shall have the right to purchase Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

#### **7. METER READING**

No more often than once per month nor less often than once per year during the term of this Agreement, Company shall read the Customer System renewable energy production meter for purpose of determining the payment amount per Section 5 above. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

#### **8. WARRANTY**

**COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.**

#### **9. LIMITATION OF LIABILITY**

**COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.**

## 10. TERMINATION

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within thirty (30) days following written notice thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

## 11. MISCELLANEOUS

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1 Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by the Customer without the prior written consent of Company.
- 11.2 Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3 Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4 Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5 Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6 Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7 Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.

- 11.8 Customer Sale of Facility. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.
- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:** **UNS Electric, Inc.**  
PO Box 3099  
Kingman, Arizona 86402  
Fax: (928) 681-8915  
Attn: Energy Services Department

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Annual Energy Reserved: \_\_\_\_\_ KWh**

**Estimated Annual Payment \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**



**Application Process**  
**ATTACHMENT A**  
**Biomass/Biogas (Cooling) System Qualifications**

All biomass/biogas (cooling) Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. Biomass/Biogas (cooling) system installations involving a regulated boiler or pressure vessel are required to comply with all Arizona state boiler regulations; provide a qualifying boiler inspection identification number; and keep all applicable permits in good standing.
2. Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
3. System must include a dedicated performance meter to allow for monitoring of the amount of useful cooling produced. As an exception to the REST Rule R14-2-1803.B, energy production will be calculated at one kW-hr per ton of metered cooling for systems with capacity of 100 tons or less and one kW-hr per 1.33 tons for systems with a capacity of greater than 100 tons.
4. The system will have a material and labor warranty of at least five years.
5. The system must meet Arizona DEQ environmental standards.
6. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
7. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel.
8. Energy storage devices are not allowed as part of the Customer System unless the energy storage device is a separate component and Company can locate the SunShare Meter at the Customer System's output.
9. Installation must have been made after January 1, 1997.
10. All Customer System installations must be completed in a professional, workmanlike and safe manner.

**UNS Electric, Inc.**  
**GreenWatts<sup>™</sup> SunShare Program**  
**Performance Based Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**Biomass/Biogas (Electric)**

This GreenWatts<sup>™</sup> SunShare Performance Based Incentive (PBI) Program Renewable Energy Credit Purchase Agreement (the "Agreement") is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer"). Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of renewable generation facilities and the consumption of renewable electricity within its service territory, while concurrently reducing the cost of renewable generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install renewable generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts<sup>™</sup>, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, \_\_\_\_\_.  
Arizona (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM:**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:

## 1.1 Renewable Energy System

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy biomass/biogas (electric) generation technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payments. Customer environmental credits and Company payments shall be based on the actual metered renewable energy production as explained in Section 5 below. This represents a Performance Based Incentive payment method.

## 2. SYSTEM INSTALLATION

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## 3. SYSTEM INSPECTION

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## 4. SYSTEM ELECTRICAL OUTPUT

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and, upon receipt of payment by the Company for the Performance Based Incentive based on actual energy generated from the installation and use of the Customer System, assigns by operation of this Agreement all resultant associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff (REST) program (the "Renewable Energy Credits"). Company will thereafter return any and all value of such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until the last day of the month of \_\_\_\_\_ in 20\_\_\_\_ and shall survive any termination of this Agreement.

## 5. RENEWABLE ENERGY CREDIT PURCHASE

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall no more frequently than monthly, nor less frequently than annually, pay to Customer \$0.\_\_\_\_\_ per metered AC kilowatt-hour of net renewable energy production from

the Customer System installed under this Agreement, provided that said System is operational within 180 days after execution of this Agreement. Payment shall not be for less than \$25.00 unless a full twelve (12) months has elapsed since the last such payment. All such payments shall be made by Company within thirty (30) days of the end of each calendar month in which energy is generated by the Customer System and received by Company. The Customer System's first payment shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System, and a successful Customer System inspection pursuant to Section 3 above.

#### **6. RIGHTS FOR CREDITS**

Company shall have the right to purchase Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

#### **7. METER READING**

No more often than once per month nor less often than once per year during the term of this Agreement, Company shall read the Customer System renewable energy production meter for purpose of determining the payment amount per Section 5 above. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

#### **8. WARRANTY**

**COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.**

#### **9. LIMITATION OF LIABILITY**

**COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.**

#### **10. TERMINATION**

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within thirty (30) days following written notice thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

## 11. MISCELLANEOUS

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1 Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by the Customer without the prior written consent of Company.
- 11.2 Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3 Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4 Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5 Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6 Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7 Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.
- 11.8 Customer Sale of Facility. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall

expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.

- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:**                      **UNS Electric, Inc.**  
PO Box 3099  
Kingman, Arizona 86402  
Fax: (928) 681-8915  
Attn: Energy Services Department

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Annual Energy Reserved: \_\_\_\_\_ KWh**

**Estimated Annual Payment \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**

**Application Process**  
**ATTACHMENT A**  
**Biomass/Biogas (Electric) System Qualifications**

All biomass/biogas (electric) Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. Biomass/Biogas system installations involving a regulated boiler or pressure vessel are required to comply with all Arizona state boiler regulations; provide a qualifying boiler inspection identification number; and keep all applicable permits in good standing.
2. System must include a dedicated performance meter to allow for monitoring of the amount of electricity produced.
3. Pre-operational/or pre-commissioning energy savings and design output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a qualified registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
4. The system will have a material and labor warranty of at least five years.
5. The system must meet Arizona DEQ environmental standards.
6. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
7. For Customer Systems, Company will provide a meter and meter socket that will be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel.
8. Energy storage devices are not allowed as part of the Customer System unless the energy storage device is a separate component and Company can locate the SunShare Meter at the Customer System's output.
9. Installation must have been made after January 1, 1997.
10. The Customer must be connected to the Company's electric grid.



11. All Customer System installations must be completed in a professional, workmanlike and safe manner.

**UNS Electric, Inc.**  
**GreenWatts<sup>TM</sup> SunShare Program**  
**Performance Based Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**Biomass/Biogas (Thermal)**

This GreenWatts<sup>TM</sup> SunShare Performance Based Incentive (PBI) Program Renewable Energy Credit Purchase Agreement (the "Agreement") is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer"). Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of renewable electricity generation facilities and the consumption of renewable electricity within its service territory, while concurrently reducing the cost of renewable electric generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install renewable generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts<sup>TM</sup>, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, \_\_\_\_\_, Arizona (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM:**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:

## 1.1 Renewable Energy System

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy biomass/biogas (thermal) generation technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payments. Customer environmental credits and Company payments shall be based on the actual metered renewable energy production as explained in Section 5 below. This represents a Performance Based Incentive payment method.

## 2. SYSTEM INSTALLATION

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A, including, without limitation, a proper interconnection with Company's existing power grid. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## 3. SYSTEM INSPECTION

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## 4. SYSTEM ELECTRICAL OUTPUT

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and, upon receipt of payment by the Company for the Performance Based Incentive based on actual energy generated from the installation and use of the Customer System, assigns by operation of this Agreement all resultant associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff (REST) program (the "Renewable Energy Credits"). Company will thereafter return any and all value of such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until the last day of the month of \_\_\_\_\_ in 20\_\_\_\_ and shall survive any termination of this Agreement.

## 5. RENEWABLE ENERGY CREDIT PURCHASE

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall no more frequently than monthly, nor less frequently than annually, pay to

Customer \$0.\_\_\_\_\_ per metered AC kilowatt-hour of net renewable energy production from the Customer System installed under this Agreement, provided that said System is operational within 180 days after execution of this Agreement. Payment shall not be for less than \$25.00 unless a full twelve (12) months has elapsed since the last such payment. All such payments shall be made by Company within thirty (30) days of the end of each calendar month in which energy is generated by the Customer System and received by Company. The Customer System's first payment shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System, and a successful Customer System inspection pursuant to Section 3 above. Energy for payment shall be calculated at the conversion rate of 3,415 Btu per kWh as recorded on the dedicated performance customer supplied meter to allow for monitoring of the amount of useful heat produced.

#### **6. RIGHTS FOR CREDITS**

Company shall have the right to purchase Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

#### **7. METER READING**

No more often than once per month nor less often than once per year during the term of this Agreement, Company shall read the Customer System renewable energy production meter for purpose of determining the payment amount per Section 5 above. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

#### **8. WARRANTY**

COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.

#### **9. LIMITATION OF LIABILITY**

COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.

## 10. TERMINATION

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within thirty (30) days following written notice thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

## 11. MISCELLANEOUS

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1 Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by the Customer without the prior written consent of Company.
- 11.2 Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3 Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4 Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5 Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6 Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7 Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.

- 11.8 Customer Sale of Facility. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.
- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:** **UNS Electric, Inc.**  
PO Box 3099  
Kingman, Arizona 86402  
Fax: (928) 681-8915  
Attn: Energy Services Department

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Annual Energy Reserved: \_\_\_\_\_ KWh**

**Estimated Annual Payment \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**

**Application Process**  
**ATTACHMENT A**  
**Biomass/Biogas (Thermal) System Qualifications**

All biomass/biogas (thermal) Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. Biomass/Biogas (thermal) system installations involving a regulated boiler or pressure vessel are required to comply with all Arizona state boiler regulations; provide a qualifying boiler inspection identification number; and keep all applicable permits in good standing.
2. System must include a dedicated performance meter to allow for monitoring of the amount of electricity produced.
3. Pre-operational/or pre-commissioning energy savings and design output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a qualified registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
4. The system will have a material and labor warranty of at least five years.
5. The system must meet Arizona DEQ environmental standards.
6. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
7. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel.
8. Energy storage devices are not allowed as part of the Customer System unless the energy storage device is a separate component and Company can locate the SunShare Meter at the Customer System's output.
9. Installation must have been made after January 1, 1997.
10. All Customer System installations must be completed in a professional, workmanlike and safe manner.



**UNS Electric, Inc.**  
**GreenWatts<sup>TM</sup> SunShare Program**  
**Performance Based Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**Biomass/Biogas CHP (Electric)**

This GreenWatts<sup>TM</sup> SunShare Performance Based Incentive (PBI) Program Renewable Energy Credit Purchase Agreement (the "Agreement") is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer"). Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of renewable electricity generation facilities and the consumption of renewable electricity within its service territory, while concurrently reducing the cost of renewable electric generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install renewable generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts<sup>TM</sup>, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, \_\_\_\_\_, \_\_\_\_\_, Arizona (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM:**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:

## 1.1 Renewable Energy System

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy biomass/biogas CHP (electric) generation technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payments. Customer environmental credits and Company payments shall be based on the actual metered renewable energy production as explained in Section 5 below. This represents a Performance Based Incentive payment method.

## 2. SYSTEM INSTALLATION

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A, including, without limitation, a proper interconnection with Company's existing power grid. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## 3. SYSTEM INSPECTION

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## 4. SYSTEM ELECTRICAL OUTPUT

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and, upon receipt of payment by the Company for the Performance Based Incentive based on actual energy generated from the installation and use of the Customer System, assigns by operation of this Agreement all resultant associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff (REST) program (the "Renewable Energy Credits"). Company will thereafter return any and all value of such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until the last day of the month of \_\_\_\_\_ in 20\_\_\_\_ and shall survive any termination of this Agreement.

## 5. RENEWABLE ENERGY CREDIT PURCHASE

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall no more frequently than monthly, nor less frequently than annually, pay to

Customer \$0.\_\_\_\_\_ per metered AC kilowatt-hour of net renewable energy production from the Customer System installed under this Agreement, provided that said System is operational within 180 days after execution of this Agreement. Payment shall not be for less than \$25.00 unless a full twelve (12) months has elapsed since the last such payment. All such payments shall be made by Company within thirty (30) days of the end of each calendar month in which energy is generated by the Customer System and received by Company. The Customer System's first payment shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System, and a successful Customer System inspection pursuant to Section 3 above.

#### **6. RIGHTS FOR CREDITS**

Company shall have the right to purchase Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

#### **7. METER READING**

No more often than once per month nor less often than once per year during the term of this Agreement, Company shall read the Customer System renewable energy production meter for purpose of determining the payment amount per Section 5 above. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

#### **8. WARRANTY**

**COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.**

#### **9. LIMITATION OF LIABILITY**

**COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.**

#### **10. TERMINATION**

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within thirty (30) days following written notice thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

## 11. MISCELLANEOUS

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1 Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by the Customer without the prior written consent of Company.
- 11.2 Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3 Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4 Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5 Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6 Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7 Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.
- 11.8 Customer Sale of Facility. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall

expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.

- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:** **UNS Electric, Inc.**  
PO Box 3099  
Kingman, Arizona 86402  
Fax: (928) 681-8915  
Attn: Energy Services Department

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Annual Energy Reserved: \_\_\_\_\_ KWh**

**Estimated Annual Payment \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**

**Application Process**  
**ATTACHMENT A**  
**Biomass/Biogas CHP (Electric) System Qualifications**

All biomass/biogas CHP (electric) Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. An energy savings and designed output report for the system must be provided. The report must include either a testing certification for a substantially similar system prepared by a publicly funded laboratory or an engineering report stamped by a qualified registered professional engineer. The engineering report and/or testing certification shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications. Additional information may be required as part of the RECPP requirements.
2. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code, including Article 690 and all grounding, conductor, raceway, overcurrent protection, disconnect and labeling requirements.
3. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code in effect in the jurisdiction where the installation is being completed (NEC).
4. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
5. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel.
6. Energy storage devices are not allowed as part of the Customer System unless the energy storage device is a separate component and Company can locate the SunShare Meter at the Customer System's output.
7. Installation must have been made after January 1, 1997.
8. The Customer must be connected to the Company's electric grid.

9. All Customer System installations must be completed in a professional, workmanlike and safe manner.



**UNS Electric, Inc.**  
**GreenWatts<sup>TM</sup> SunShare Program**  
**Performance Based Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**Biomass/Biogas CHP (Thermal)**

This GreenWatts<sup>TM</sup> SunShare Performance Based Incentive (PBI) Program Renewable Energy Credit Purchase Agreement (the "Agreement") is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer"). Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of renewable electricity generation facilities and the consumption of renewable electricity within its service territory, while concurrently reducing the cost of renewable electric generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install renewable generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts<sup>TM</sup>, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, \_\_\_\_\_, \_\_\_\_\_, Arizona (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM:**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:

## 1.1 Renewable Energy System

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy biomass/biogas CHP (thermal) generation technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payments. Customer environmental credits and Company payments shall be based on the actual metered renewable energy production as explained in Section 5 below. This represents a Performance Based Incentive payment method.

## 2. SYSTEM INSTALLATION

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## 3. SYSTEM INSPECTION

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## 4. SYSTEM ELECTRICAL OUTPUT

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and, upon receipt of payment by the Company for the Performance Based Incentive based on actual energy generated from the installation and use of the Customer System, assigns by operation of this Agreement all resultant associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff (REST) program (the "Renewable Energy Credits"). Company will thereafter return any and all value of such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until the last day of the month of \_\_\_\_\_ in 20\_\_\_\_ and shall survive any termination of this Agreement.

## 5. RENEWABLE ENERGY CREDIT PURCHASE

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall no more frequently than monthly, nor less frequently than annually, pay to Customer \$0.\_\_\_\_\_ per metered AC kilowatt-hour of net renewable energy production from

the Customer System installed under this Agreement, provided that said System is operational within 180 days after execution of this Agreement. Payment shall not be for less than \$25.00 unless a full twelve (12) months has elapsed since the last such payment. All such payments shall be made by Company within thirty (30) days of the end of each calendar month in which energy is generated by the Customer System and received by Company. The Customer System's first payment shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System, and a successful Customer System inspection pursuant to Section 3 above. Energy for payment shall be calculated at the conversion rate of 3,415 Btu per kWh as recorded on the dedicated performance customer supplied meter to allow for monitoring of the amount of useful heat produced.

**6. RIGHTS FOR CREDITS**

Company shall have the right to purchase Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

**7. METER READING**

No more often than once per month nor less often than once per year during the term of this Agreement, Company shall read the Customer System renewable energy production meter for purpose of determining the payment amount per Section 5 above. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

**8. WARRANTY**

**COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.**

**9. LIMITATION OF LIABILITY**

**COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.**

**10. TERMINATION**

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within thirty (30) days following written notice

thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

## 11. MISCELLANEOUS

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1 Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by the Customer without the prior written consent of Company.
- 11.2 Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3 Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4 Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5 Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6 Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7 Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.
- 11.8 Customer Sale of Facility. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-

in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.

- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:** **UNS Electric, Inc.**  
PO Box 3099  
Kingman, Arizona 86402  
Fax: (928) 681-8915  
Attn: Energy Services Department

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Annual Energy Reserved: \_\_\_\_\_ KWh**

**Estimated Annual Payment \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**

**Application Process**  
**ATTACHMENT A**  
**Biomass/Biogas CHP (Thermal) System Qualifications**

All Biomass/Biogas CHP (Thermal) Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. An energy savings and designed output report for the system must be provided. The report must include either a testing certification for a substantially similar system prepared by a publicly funded laboratory or an engineering report stamped by a qualified registered professional engineer. The engineering report and/or testing certification shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications. Additional information may be required as part of the RECPP requirements.
2. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
3. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel.
4. Energy storage devices are not allowed as part of the Customer System unless the energy storage device is a separate component and Company can locate the SunShare Meter at the Customer System's output.
5. Installation must have been made after January 1, 1997.
6. All Customer System installations must be completed in a professional, workmanlike and safe manner.

**UNS Electric, Inc.**  
**GreenWatts™ SunShare Program**  
**Performance Based Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**Geothermal (Cooling)**

This GreenWatts™ SunShare Performance Based Incentive (PBI) Program Renewable Energy Credit Purchase Agreement (the "Agreement") is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer"). Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of renewable generation facilities and the consumption of renewable electricity within its service territory, while concurrently reducing the cost of renewable generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install renewable generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts™, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, at the address of \_\_\_\_\_, \_\_\_\_\_, Arizona (The "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM:**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:



## 1.1 Renewable Energy System

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy geothermal (cooling) generation technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payments. Customer environmental credits and Company payments shall be based on the actual metered renewable energy production as explained in Section 5 below. This represents a Performance Based Incentive payment method.

## 2. SYSTEM INSTALLATION

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## 3. SYSTEM INSPECTION

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## 4. SYSTEM ELECTRICAL OUTPUT

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and, upon receipt of payment by the Company for the Performance Based Incentive based on actual energy generated from the installation and use of the Customer System, assigns by operation of this Agreement all resultant associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff (REST) program (the "Renewable Energy Credits"). Company will thereafter return any and all value of such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until the last day of the month of \_\_\_\_\_ in 20\_\_\_\_ and shall survive any termination of this Agreement.

## 5. RENEWABLE ENERGY CREDIT PURCHASE

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall no more frequently than monthly, nor less frequently than annually, pay to Customer \$0.\_\_\_\_\_ per metered AC kilowatt-hour of net renewable energy production from

the Customer System installed under this Agreement, provided that said System is operational within 180 days after execution of this Agreement. Payment shall not be for less than \$25.00 unless a full twelve (12) months has elapsed since the last such payment. All such payments shall be made by Company within thirty (30) days of the end of each calendar month in which energy is generated by the Customer System and received by Company. The Customer System's first payment shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System, and a successful Customer System inspection pursuant to Section 3 above. Energy for payment will be calculated at one kW-hr per ton of metered cooling for systems with capacity of 100 tons or less and one kW-hr per 1.33 tons for systems with a capacity of greater than 100 tons as recorded on the cooling energy meter installed as part of the Customer System.

#### **6. RIGHTS FOR CREDITS**

Company shall have the right to purchase Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

#### **7. METER READING**

No more often than once per month nor less often than once per year during the term of this Agreement, Company shall read the Customer System renewable energy production meter for purpose of determining the payment amount per Section 5 above. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

#### **8. WARRANTY**

**COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.**

#### **9. LIMITATION OF LIABILITY**

**COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.**

## 10. TERMINATION

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within thirty (30) days following written notice thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

## 11. MISCELLANEOUS

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1 Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by the Customer without the prior written consent of Company.
- 11.2 Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3 Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4 Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5 Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6 Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7 Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.

- 11.8 Customer Sale of Facility. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.
- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:**                      **UNS Electric, Inc.**  
PO Box 3099  
Kingman, Arizona 86402  
Fax: (928) 681-8915  
Attn: Energy Services Department

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Annual Energy Reserved: \_\_\_\_\_ KWh**

**Estimated Annual Payment \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**

**Application Process**  
**ATTACHMENT A**  
**Geothermal (Cooling) System Qualifications**

All geothermal (cooling) Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. Geothermal (cooling) system installations involving a thermal system are required to comply with all Arizona state regulations; provide a qualifying inspection identification number; and keep all applicable permits in good standing.
2. Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
3. System must include a dedicated performance meter to allow for monitoring of the amount of useful cooling produced. As an exception to the REST Rule R14-2-1803.B, energy production will be calculated at one kW-hr per ton of metered cooling for systems with capacity of 100 tons or less and one kW-hr per 1.33 tons for systems with a capacity of greater than 100 tons.
4. The system will have a material and labor warranty of at least five years.
5. The system must meet Arizona DEQ environmental standards.
6. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code, including Article 690 and all grounding, conductor, raceway, overcurrent protection, disconnect and labeling requirements.
7. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code.
8. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
9. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel.

10. Energy storage devices are not allowed as part of the Customer System unless the energy storage device is a separate component and Company can locate the SunShare Meter at the Customer System's output.
11. Installation must have been made after January 1, 1997.
12. All Customer System installations must be completed in a professional, workmanlike and safe manner.

**UNS Electric, Inc.  
GreenWatts™ SunShare Program  
Performance Based Incentive  
Renewable Energy Credit Purchase Agreement  
Geothermal (Electric)**

This GreenWatts™ SunShare Performance Based Incentive (PBI) Program Renewable Energy Credit Purchase Agreement (the “Agreement”) is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation (“Company”), and \_\_\_\_\_, (“Customer”). Company and Customer may be referred to individually herein as a “Party” or collectively as the “Parties.”

## RECITALS

A. Company desires to increase the number of renewable electricity generation facilities and the consumption of renewable electricity within its service territory, while concurrently reducing the cost of renewable electric generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install renewable generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts™, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, \_\_\_\_\_, \_\_\_\_\_, Arizona (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

## AGREEMENT

**1. PROGRAM:**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:



## 1.1 Renewable Energy System

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy geothermal (electric) generation technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payments. Customer environmental credits and Company payments shall be based on the actual metered renewable energy production as explained in Section 5 below. This represents a Performance Based Incentive payment method.

## 2. SYSTEM INSTALLATION

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A, including, without limitation, a proper interconnection with Company's existing power grid. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## 3. SYSTEM INSPECTION

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## 4. SYSTEM ELECTRICAL OUTPUT

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and, upon receipt of payment by the Company for the Performance Based Incentive based on actual energy generated from the installation and use of the Customer System, assigns by operation of this Agreement all resultant associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff (REST) program (the "Renewable Energy Credits"). Company will thereafter return any and all value of such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until the last day of the month of \_\_\_\_\_ in 20\_\_\_\_ and shall survive any termination of this Agreement.

## 5. RENEWABLE ENERGY CREDIT PURCHASE

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall no more frequently than monthly, nor less frequently than annually, pay to

Customer \$0.\_\_\_\_\_ per metered AC kilowatt-hour of net renewable energy production from the Customer System installed under this Agreement, provided that said System is operational within 180 days after execution of this Agreement. Payment shall not be for less than \$25.00 unless a full twelve (12) months has elapsed since the last such payment. All such payments shall be made by Company within thirty (30) days of the end of each calendar month in which energy is generated by the Customer System and received by Company. The Customer System's first payment shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System, and a successful Customer System inspection pursuant to Section 3 above.

#### **6. RIGHTS FOR CREDITS**

Company shall have the right to purchase Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

#### **7. METER READING**

No more often than once per month nor less often than once per year during the term of this Agreement, Company shall read the Customer System renewable energy production meter for purpose of determining the payment amount per Section 5 above. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

#### **8. WARRANTY**

**COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.**

#### **9. LIMITATION OF LIABILITY**

**COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.**

#### **10. TERMINATION**

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within thirty (30) days following written notice thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

## 11. MISCELLANEOUS

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1 Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by the Customer without the prior written consent of Company.
- 11.2 Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3 Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4 Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5 Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6 Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7 Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.
- 11.8 Customer Sale of Facility. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall

expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.

- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:** **UNS Electric, Inc.**  
PO Box 3099  
Kingman, Arizona 86402  
Fax: (928) 681-8915  
Attn: Energy Services Department

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Annual Energy Reserved: \_\_\_\_\_ KWh**

**Estimated Annual Payment \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**

**Application Process**  
**ATTACHMENT A**  
**Geothermal (Electric) System Qualifications**

All geothermal (electric) Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. Geothermal (electric) system installations involving a regulated boiler or pressure vessel are required to comply with all Arizona state boiler regulations; provide a qualifying boiler inspection identification number; and keep all applicable permits in good standing.
2. Pre-operational/or pre-commissioning energy savings and design output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a qualified registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
3. The system will have a material and labor warranty of at least five years.
4. The system must meet Arizona DEQ environmental standards.
5. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code, including Article 690 and all grounding, conductor, raceway, overcurrent protection, disconnect and labeling requirements.
6. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code in effect in the jurisdiction where the installation is being completed (NEC).
7. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
8. For Residential Customer Systems, Company will provide a meter and meter socket that will be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel.

9. Energy storage devices are not allowed as part of the Customer System unless the energy storage device is a separate component and Company can locate the SunShare Meter at the Customer System's output.
10. Installation must have been made after January 1, 1997.
11. The Customer must be connected to the Company's electric grid.
12. All Customer System installations must be completed in a professional, workmanlike and safe manner.

**UNS Electric, Inc.**  
**GreenWatts™ SunShare Program**  
**Performance Based Incentive**  
**able Energy Credit Purchase Agree**  
**Geothermal (Thermal)**

This GreenWatts™ SunShare Performance Based Incentive (PBI) Program Renewable Energy Credit Purchase Agreement (the “Agreement”) is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation (“Company”), and \_\_\_\_\_, (“Customer”). Company and Customer may be referred to individually herein as a “Party” or collectively as the “Parties.”

## RECITALS

A. Company desires to increase the number of renewable electricity generation facilities and the consumption of renewable electricity within its service territory, while concurrently reducing the cost of renewable electric generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install renewable generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts™, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, \_\_\_\_\_, \_\_\_\_\_, Arizona (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

## AGREEMENT

**1. PROGRAM:**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:



## 1.1 Renewable Energy System

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy geothermal (thermal) generation technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payments. Customer environmental credits and Company payments shall be based on the actual metered renewable energy production as explained in Section 5 below. This represents a Performance Based Incentive payment method.

## 2. SYSTEM INSTALLATION

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## 3. SYSTEM INSPECTION

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## 4. SYSTEM ELECTRICAL OUTPUT

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and, upon receipt of payment by the Company for the Performance Based Incentive based on actual energy generated from the installation and use of the Customer System, assigns by operation of this Agreement all resultant associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff (REST) program (the "Renewable Energy Credits"). Company will thereafter return any and all such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until the last day of the month of \_\_\_\_\_ in 20\_\_\_\_ and shall survive any termination of this Agreement.

## 5. RENEWABLE ENERGY CREDIT PURCHASE

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall no more frequently than monthly, nor less frequently than annually, pay to Customer \$0.\_\_\_\_\_ per metered AC kilowatt-hour of net renewable energy production from

the Customer System installed under this Agreement, provided that said System is operational within 180 days after execution of this Agreement. Payment shall not be for less than \$25.00 unless a full twelve (12) months has elapsed since the last such payment. All such payments shall be made by Company within thirty (30) days of the end of each calendar month in which energy is generated by the Customer System and received by Company. The Customer System's first payment shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System, and a successful Customer System inspection pursuant to Section 3 above. Energy for payment shall be calculated at the conversion rate of 3,415 Btu per kWh as recorded on the dedicated performance customer supplied meter to allow for monitoring of the amount of useful heat produced.

#### **6. RIGHTS FOR CREDITS**

Company shall have the right to purchase Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

#### **7. METER READING**

No more often than once per month nor less often than once per year during the term of this Agreement, Company shall read the Customer System renewable energy production meter for purpose of determining the payment amount per Section 5 above. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

#### **8. WARRANTY**

COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.

#### **9. LIMITATION OF LIABILITY**

COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.

#### **10. TERMINATION**

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within thirty (30) days following written notice

thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

## 11. MISCELLANEOUS

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1 Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by the Customer without the prior written consent of Company.
- 11.2 Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3 Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4 Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5 Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6 Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7 Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.
- 11.8 Customer Sale of Facility. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-

in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.

- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:**                      **UNS Electric, Inc.**  
                                         PO Box 3099  
                                         Kingman, Arizona 86402  
                                         Fax: (928) 681-8915  
                                         Attn: Energy Services Department

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

Estimated Annual Energy Reserved: \_\_\_\_\_ KWh

Estimated Annual Payment \$ \_\_\_\_\_

Date Reserved: \_\_\_\_\_

**Application Process**  
**ATTACHMENT A**  
**Geothermal (Thermal) System Qualifications**

All geothermal (thermal) Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. Geothermal system installations involving a regulated boiler or pressure vessel are required to comply with all Arizona state boiler regulations; provide a qualifying boiler inspection identification number; and keep all applicable permits in good standing.
2. Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
3. System must include a dedicated performance meter to allow for monitoring of the amount of useful cooling produced. As an exception to the REST Rule R14-2-1803.B, energy production will be calculated at one kW-hr per ton of metered cooling for systems with capacity of 100 tons or less and one kW-hr per 1.33 tons for systems with a capacity of greater than 100 tons.
4. Energy production for space heating and process heating will be calculated as one kWh of energy per 3,415 Btu of useful heat delivered by the system and used by the building space or process.
5. The system will have a material and labor warranty of at least five years.
6. The system must meet Arizona DEQ environmental standards.
7. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code in effect in the jurisdiction where the installation is being completed (NEC).
8. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
9. Installation must have been made after January 1, 1997.

10. All Customer System installations must be completed in a professional, workmanlike and safe manner.

**UNS Electric, Inc.**  
**GreenWatts<sup>TM</sup> SunShare Program**  
**Performance Based Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**Non-Residential Off-Grid Solar**

This GreenWatts<sup>TM</sup> SunShare Performance Based Incentive (PBI) Program Renewable Energy Credit Purchase Agreement (the "Agreement") is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer"). Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of renewable electricity generation facilities and the consumption of renewable electricity within its service territory, while concurrently reducing the cost of renewable electric generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install renewable generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts<sup>TM</sup>, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, at the address of \_\_\_\_\_, \_\_\_\_\_, Arizona (The "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM:**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:



## 1.1 Renewable Energy System

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy non-residential off-grid solar generation technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payments. Customer environmental credits and Company payments shall be based on the actual metered renewable energy production as explained in Section 5 below. This represents a Performance Based Incentive payment method.

## 2. SYSTEM INSTALLATION

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A, including, without limitation, a proper interconnection with Company's existing power grid. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## 3. SYSTEM INSPECTION

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## 4. SYSTEM ELECTRICAL OUTPUT

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and, upon receipt of payment by the Company for the Performance Based Incentive based on actual energy generated from the installation and use of the Customer System, assigns by operation of this Agreement all resultant associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff (REST) program (the "Renewable Energy Credits"). Company will thereafter return any and all such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until the last day of the month of \_\_\_\_\_ in 20\_\_\_\_ and shall survive any termination of this Agreement.

## 5. RENEWABLE ENERGY CREDIT PURCHASE

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall no more frequently than monthly, nor less frequently than annually, pay to

Customer \$0.\_\_\_\_\_ per metered AC kilowatt-hour of net renewable energy production from the Customer System installed under this Agreement, provided that said System is operational within 180 days after execution of this Agreement. Payment shall not be for less than \$25.00 unless a full twelve (12) months has elapsed since the last such payment. All such payments shall be made by Company within thirty (30) days of the end of each calendar month in which energy is generated by the Customer System and received by Company. The Customer System's first payment shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System, and a successful Customer System inspection pursuant to Section 3 above.

#### **6. RIGHTS FOR CREDITS**

Company shall have the right to purchase Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

#### **7. METER READING**

No more often than once per month nor less often than once per year during the term of this Agreement, Company shall read the Customer System renewable energy production meter for purpose of determining the payment amount per Section 5 above. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

#### **8. WARRANTY**

**COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.**

#### **9. LIMITATION OF LIABILITY**

**COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.**

#### **10. TERMINATION**

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within thirty (30) days following written notice thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

## 11. MISCELLANEOUS

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1 Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by the Customer without the prior written consent of Company.
- 11.2 Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3 Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4 Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5 Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6 Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7 Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.
- 11.8 Customer Sale of Residence. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall

expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.

- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:**                      **UNS Electric, Inc.**  
PO Box 3099  
Kingman, Arizona 86402  
Fax: (928) 681-8915  
Attn: Energy Services Department

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Annual Energy Reserved: \_\_\_\_\_ KWh**

**Estimated Annual Payment \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**

**Application Process**  
**ATTACHMENT A**  
**Non-Residential Off-Grid Solar System Qualifications**

All non-residential off-grid solar Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. All systems shall be installed with a horizontal tilt angle between 10 degrees and 60 degrees, and an azimuth angle of +/- 100 degrees of due south. Installation configurations for some systems receiving a UFI will not be eligible for the full RECPP incentive. The reduction will be determined by the UNS ELECTRIC developed de-rating chart, Attachment B of this document, and as discussed further in this report under the section titled Conforming Project Incentives.
2. Qualifying systems using Building Integrated Photovoltaic (BIPV) modules of total array capacity of 5 kWDC or less shall receive 90% of the UFI incentive value for PV systems listed in Attachment A. Systems using BIPV module of total array capacity of greater than 5 kWDC shall only receive a PBI.
3. Photovoltaic modules must be covered by a manufacturer's warranty of at least 20 years.
4. Inverters must be covered by a manufacturer's warranty of at least ten years to receive a UFI and at least five years to receive a PBI.
5. The minimum PV array size shall be no less than 600 Wdc and the maximum PV array size shall not exceed 2,000 Wdc.
6. All photovoltaic modules must be certified by a nationally recognized testing laboratory as meeting the requirements of UL 1703.
7. Off-grid systems will not be metered. Compliance reporting production will be based on an annual 20% capacity factor using nameplate DC rating for capacity.
8. All other electrical components must be UL listed.
9. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code, including Article 690 and all grounding, conductor, raceway, overcurrent protection, disconnect and labeling requirements.
10. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code in effect in the jurisdiction where the installation is being completed (NEC).

11. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.

12. The Customer System installation must meet the UNS Electric Service Requirements as follows:

“AN AC DISCONNECT MEANS SHALL BE PROVIDED IN AN AREA ACCESSIBLE AT ALL TIMES TO THE COMPANY ON ALL UNGROUNDED AC CONDUCTORS AND SHALL CONSIST OF A LOCKABLE GANG OPERATED DISCONNECT CLEARLY INDICATING OPEN OR CLOSED. THE SWITCH SHALL BE VISUALLY INSPECTED TO DETERMINE THAT IT IS OPEN. THE SWITCH SHALL BE CLEARLY LABELED “DG SERVICE DISCONNECT.”

13. For Residential Customer Systems, Company will provide a meter and meter socket that will be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel.

14. Energy storage devices are not allowed as part of the Customer System unless the energy storage device is a separate component and Company can locate the SunShare Meter at the Customer System's output.

15. Installation must have been made after January 1, 1997.

16. The Customer must be connected to the Company's electric grid.

17. All Customer System installations must be completed in a professional, workmanlike and safe manner.

**UNS Electric, Inc.**  
**GreenWatts™ SunShare Program**  
**Performance Based Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**Non-Residential On-Grid Solar**  
**20 kW or Greater**

This GreenWatts™ SunShare Performance Based Incentive (PBI) Program Renewable Energy Credit Purchase Agreement (the "Agreement") is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer"). Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of renewable electricity generation facilities and the consumption of renewable electricity within its service territory, while concurrently reducing the cost of renewable electric generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install renewable generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts™, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, at the address of \_\_\_\_\_, \_\_\_\_\_, Arizona (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM:**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:



## 1.1 Renewable Energy System

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy non-residential grid tie solar generation technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payments. Customer environmental credits and Company payments shall be based on the actual metered renewable energy production as explained in Section 5 below. This represents a Performance Based Incentive payment method.

## 2. SYSTEM INSTALLATION

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A, including, without limitation, a proper interconnection with Company's existing power grid. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## 3. SYSTEM INSPECTION

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## 4. SYSTEM ELECTRICAL OUTPUT

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and, upon receipt of payment by the Company for the Performance Based Incentive based on actual energy generated from the installation and use of the Customer System, assigns by operation of this Agreement all resultant associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff (REST) program (the "Renewable Energy Credits"). Company will thereafter return any and all value of such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until the last day of the month of \_\_\_\_\_ in 20\_\_\_\_ and shall survive any termination of this Agreement.

## 5. RENEWABLE ENERGY CREDIT PURCHASE

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement,

Company shall no more frequently than monthly, nor less frequently than annually, pay to Customer \$0.\_\_\_\_\_ per metered AC kilowatt-hour of net renewable energy production from the Customer System installed under this Agreement, provided that said System is operational within 180 days after execution of this Agreement. Payment shall not be for less than \$25.00 unless a full twelve (12) months has elapsed since the last such payment. All such payments shall be made by Company within thirty (30) days of the end of each calendar month in which energy is generated by the Customer System and received by Company. The Customer System's first payment shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System, and a successful Customer System inspection pursuant to Section 3 above.

#### **6. RIGHTS FOR CREDITS**

Company shall have the right to purchase Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

#### **7. METER READING**

No more often than once per month nor less often than once per year during the term of this Agreement, Company shall read the Customer System renewable energy production meter for purpose of determining the payment amount per Section 5 above. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

#### **8. WARRANTY**

**COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.**

#### **9. LIMITATION OF LIABILITY**

**COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.**

#### **10. TERMINATION**

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within thirty (30) days following written notice

thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

## 11. MISCELLANEOUS

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1 Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by the Customer without the prior written consent of Company.
- 11.2 Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3 Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4 Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5 Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6 Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7 Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.
- 11.8 Sale of Facility. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-

interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.

- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:**

**UNS Electric, Inc.**  
PO Box 3099  
Kingman, Arizona 86402  
Fax: (928) 681-8915  
Attn: Energy Services Department

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Annual Energy Reserved: \_\_\_\_\_ KWh**

**Estimated Annual Payment \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**

**Application Process**  
**ATTACHMENT A**  
**Non-Residential On-Grid Solar 20 kW or Greater System Qualifications**

All non-residential on-grid solar 20 kW or greater Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. All systems shall be installed with a horizontal tilt angle between 10 degrees and 60 degrees, and an azimuth angle of +/- 100 degrees of due south. Installation configurations for some systems receiving a UFI will not be eligible for the full RECPP incentive. The reduction will be determined by the UNS ELECTRIC developed de-rating chart, Attachment B of this document, and as discussed further in this report under the section titled Conforming Project Incentives.
2. Photovoltaic modules must be covered by a manufacturer's warranty of at least 20 years.
3. Inverters must be covered by a manufacturer's warranty of at least five years to receive a PBI.
4. All photovoltaic modules must be certified by a nationally recognized testing laboratory as meeting the requirements of UL Standard 1703.
5. All other electrical components must be UL listed.
6. The inverter must be certified as meeting the requirements of IEEE-1547 - Recommended Practice for Utility Interface of Photovoltaic Systems and it must be UL 1741 certified.
7. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code, including Article 690 and all grounding, conductor, raceway, overcurrent protection, disconnect and labeling requirements.
8. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code in effect in the jurisdiction where the installation is being completed (NEC).
9. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
10. The Customer System installation must meet the UNS Electric Service Requirements as follows:

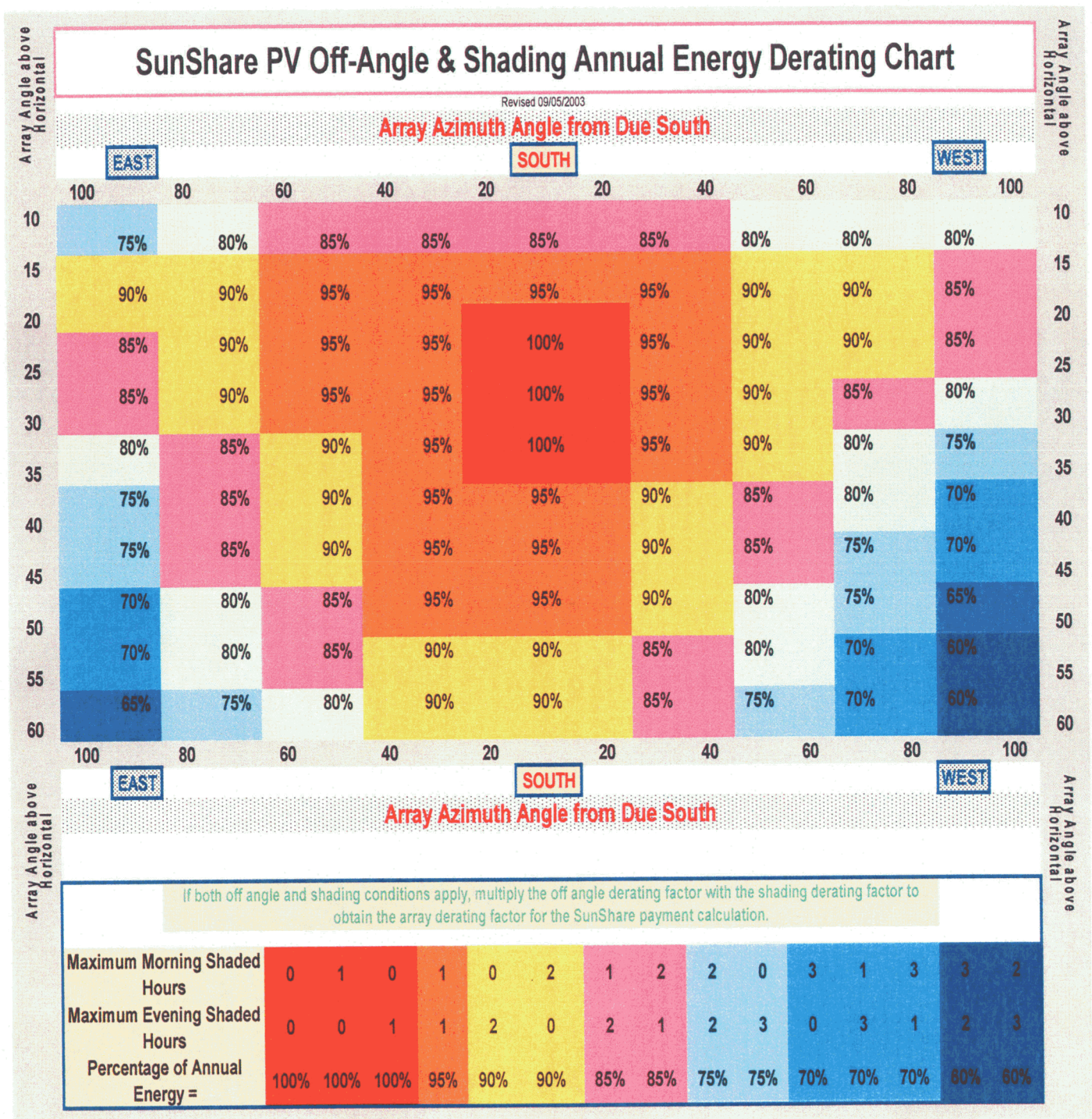
"AN AC DISCONNECT MEANS SHALL BE PROVIDED IN AN AREA ACCESSIBLE AT ALL TIMES TO THE COMPANY ON ALL UNGROUNDED AC CONDUCTORS AND SHALL CONSIST OF A LOCKABLE GANG OPERATED DISCONNECT CLEARLY INDICATING OPEN OR CLOSED. THE SWITCH SHALL BE VISUALLY INSPECTED TO DETERMINE THAT IT IS OPEN. THE SWITCH SHALL BE CLEARLY LABELED "DG SERVICE DISCONNECT."

11. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel.
12. Energy storage devices are not allowed as part of the Customer System unless the energy storage device is a separate component and Company can locate the SunShare Meter at the Customer System's output.
13. Installation must have been made after January 1, 1997.
14. The Customer must be connected to the Company's electric grid.
15. All Customer System installations must be completed in a professional, workmanlike and safe manner.



# ATTACHMENT B

## SunShare PV Off-Angle & Shading Annual Energy Derating Chart





**ATTACHMENT C**  
**Supplemental Non-Residential System Qualifications**  
**(Applicable Only for Customer Systems of Capacity Larger than 20,000 watts AC)**

1. All solar electric generating Non-Residential Customer Systems must meet the following additional system and installation requirements to qualify for UNS Electric, Inc.'s ("UNS ELECTRIC" or the "Company") GreenWatts™ SunShare Hardware Buydown Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Hardware Buydown Agreement.
2. The Non-Residential Customer System shall be operating, substantially complete and have produced an AC output at least 70% of the total array nameplate DC rating at PTC as described below.
3. Operation, Maintenance and Repair. The Customer shall be solely responsible for the operation, maintenance and repair of the Non-Residential Customer System and any and all costs and expenses associated therewith. Company will notify Customer of all Non-Residential Customer System repairs the Company determines are reasonably necessary to support proper continued electrical production of the Non-Residential Customer System. The Customer will notify the Company within five (5) business days of its receipt of any such Company repair notice if the repair requires the installation of a new inverter and/or PV module. The Customer shall complete any such repair that affects the Non-Residential Customer System performance and does not require the purchase of a new inverter or PV module(s) within five (5) business days of the Company's notice of the need for such repair. For any such repair that does require the purchase and installation of a new inverter and/or PV module, the Customer shall promptly commence and diligently pursue such repair to completion, provided, in no event shall such repair take more than thirty (30) days to complete. At all times while Company is receiving the environmental credits from the Non-Residential Customer System, Customer shall clean all PV modules in the Non-Residential Customer System as necessary to keep them free from foreign material that would visibly obscure the modules, including any dirt and/or oils.
4. Non-Residential Customer System Security. At all times during and after installation of the Non-Residential Customer System, the Customer shall use commercially reasonable efforts to provide adequate security to prevent damage or vandalism to the Non-Residential Customer System.
5. Company shall provide Customer with a revenue grade AC meter to be installed between the Non-Residential Customer System and the grid interconnection. This meter will not be used for billing, but shall be used for any official Non-Residential Customer System production output data. Company will retain ownership of the meter and be responsible for its repair if needed.
6. The utility interactive solar generation Non-Residential Customer System shall deliver an AC output in AC watts at least equal to 70% of the total array nameplate rating in DC watts as measured at performance test conditions (PTC) of 1000 watts/m<sup>2</sup> irradiance, 68

degrees F. ambient temperature and a maximum of a 2.4 mph wind speed. The Customer will verify performance of the system with a 30 day test using a temporary data monitor and acquisition system or make a single point measurement to determine the output of the system.

7. The Customer shall verify and demonstrate to Company the proper calibration and operation, through a temporary data monitor and acquisition system, of the solar insolation sensor, the ambient temperature sensor, the wind speed sensor and the AC power meter within +/- 2% of Company independent sensor data. If performance test data is not available at PTC, the indicated AC power output of the Non-Residential Customer System will be corrected to PTC by the following formula:

$$\text{Power(PTC)} = ((\text{Power(Meter)} * (1000 / \text{SolarSensor(W/M}^2))) * (1 + (((\text{AmbientTempSensor(DegF)}) - 68) * 0.0026)))$$

(On the condition that data used in the formula is taken on a cloudless day at a solar insolation of at least 950 watts per square meter and wind speed is less than 2.4 mph)

8. Company shall have the right to challenge the accurate calibration of the sensors and temporary data monitor and acquisition system with proper documentation demonstrating the reasons for the challenge. The Customer shall resolve the challenged sensor or temporary data monitor and acquisition system calibration to the satisfaction of Company prior to the data being used in the performance test being recorded.
9. Customer shall provide Company with no less than ten (10) days prior notice of any planned Customer tests to the Non-Residential Customer System. Company shall have the right to be present at any and all tests of the Non-Residential Customer System. The Customer shall provide Company notice as soon as the Non-Residential Customer System has been installed and has passed all Customer tests.
10. Customer shall provide Company with all documentation reasonably requested by Company to demonstrate to the Commission that any environmental credits transferred under the Agreement were derived from an eligible technology, that the kWh generated are accurately reported and that the environmental credits have not expired or been used by any other entity for any purpose.
11. If certified proof can not be provided of complete galvanic isolation of any and all DC from the AC output of the inverter(s) used in the Non-Residential Customer System through IEEE-1547 certification of the inverter, the Non-Residential Customer System shall include an isolation transformer installed between the inverter(s) and the grid interconnection. The transformer will be rated at full load continuous operation at 50 degrees C. at 125% of nameplate DC array rating and have an efficiency rating at nameplate DC array rating power of at least 98% as tested. The transformer will have at least one tap each of 2.5% and 5% both above and below the nominal voltage tap.

**UNS Electric, Inc.**  
**GreenWatts<sup>TM</sup> SunShare Program**  
**Performance Based Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**Non-Residential Pool Heating**

This GreenWatts<sup>TM</sup> SunShare Performance Based Incentive (PBI) Program Renewable Energy Credit Purchase Agreement (the "Agreement") is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer"). Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of renewable thermal facilities and the consumption of renewable electricity within its service territory, while concurrently reducing the cost of renewable systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install renewable generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts<sup>TM</sup>, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, at the address of \_\_\_\_\_, \_\_\_\_\_ Arizona (The "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM:**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:

## 1.1 Renewable Energy System

1.1.1 System. Customer shall purchase a renewable energy system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy non-residential pool heating technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payments. Customer environmental credits and Company payments shall be based on the actual metered renewable energy production as explained in Section 5 below. This represents a Performance Based Incentive payment method.

## 2. SYSTEM INSTALLATION

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## 3. SYSTEM INSPECTION

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## 4. SYSTEM ELECTRICAL OUTPUT

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and, upon receipt of payment by the Company for the Performance Based Incentive based on actual energy generated from the installation and use of the Customer System, assigns by operation of this Agreement all resultant associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff (REST) program (the "Renewable Energy Credits"). Company will thereafter return any and all value of such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until the last day of the month of \_\_\_\_\_ in 20\_\_\_\_ and shall survive any termination of this Agreement.

## 5. RENEWABLE ENERGY CREDIT PURCHASE

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall no more frequently than monthly, nor less frequently than annually, pay to Customer \$0.\_\_\_\_ per metered AC kilowatt-hour of net renewable energy production from the Customer System installed under this Agreement, provided that said System is operational

within 180 days after execution of this Agreement. Payment shall not be for less than \$25.00 unless a full twelve (12) months has elapsed since the last such payment. All such payments shall be made by Company within thirty (30) days of the end of each calendar month in which energy is generated by the Customer System and received by Company. The Customer System's first payment shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System, and a successful Customer System inspection pursuant to Section 3 above. Energy for payment shall be calculated at the conversion rate of 3,415 Btu per kWh as recorded on the dedicated performance customer supplied meter to allow for monitoring of the amount of useful heat produced.

## **6. RIGHTS FOR CREDITS**

Company shall have the right to purchase Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

## **7. METER READING**

No more often than once per month nor less often than once per year during the term of this Agreement, Company shall read the Customer System renewable energy production meter for purpose of determining the payment amount per Section 5 above. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

## **8. WARRANTY**

**COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.**

## **9. LIMITATION OF LIABILITY**

**COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.**

## **10. TERMINATION**

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within thirty (30) days following written notice

thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

## 11. MISCELLANEOUS

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1 Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by the Customer without the prior written consent of Company.
- 11.2 Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3 Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4 Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5 Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6 Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7 Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.
- 11.8 Customer Sale of Facility. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-interest wishes to assume the Agreement, Customer shall be responsible for

assigning the Agreement. In such instance, the successor-in-interest shall expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.

- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:** **UNS Electric, Inc.**  
PO Box 3099  
Kingman, Arizona 86402  
Fax: (928) 681-8915  
Attn: Energy Services Department

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Annual Energy Reserved: \_\_\_\_\_ KWh**

**Estimated Annual Payment \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**



**Application Process**  
**ATTACHMENT A**  
**Non-Residential Pool Heating System Qualifications**

All non-residential pool heating Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. An energy savings and designed output report for the system must be provided. The report must include either a testing certification for a substantially similar system prepared by a publicly funded laboratory or an engineering report stamped by a qualified registered professional engineer. The engineering report and/or testing certification shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications. Additional information may be required as part of the RECPP requirements.
2. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Plumbing Code
3. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
4. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel.
5. Energy storage devices are not allowed as part of the Customer System unless the energy storage device is a separate component and Company can locate the SunShare Meter at the Customer System's output.
6. Installation must have been made after January 1, 1997.
7. All Customer System installations must be completed in a professional, workmanlike and safe manner.

**UNS Electric, Inc.**  
**GreenWatts<sup>TM</sup> SunShare Program**  
**Performance Based Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**Off-Grid Small Wind**

This GreenWatts<sup>TM</sup> SunShare Performance Based Incentive (PBI) Program Renewable Energy Credit Purchase Agreement (the "Agreement") is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer"). Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of renewable electricity generation facilities and the consumption of renewable electricity within its service territory, while concurrently reducing the cost of renewable electric generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install renewable generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts<sup>TM</sup>, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, at the address of \_\_\_\_\_, \_\_\_\_\_, Arizona (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM:**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:

## 1.1 Renewable Energy System

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy off-grid small wind generation technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payments. Customer environmental credits and Company payments shall be based on the actual metered renewable energy production as explained in Section 5 below. This represents a Performance Based Incentive payment method.

## 2. SYSTEM INSTALLATION

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## 3. SYSTEM INSPECTION

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## 4. SYSTEM ELECTRICAL OUTPUT

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and, upon receipt of payment by the Company for the Performance Based Incentive based on actual energy generated from the installation and use of the Customer System, assigns by operation of this Agreement all resultant associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff (REST) program (the "Renewable Energy Credits"). Company will thereafter return any and all value of such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until the last day of the month of \_\_\_\_\_ in 200\_\_\_\_ and shall survive any termination of this Agreement.

## 5. RENEWABLE ENERGY CREDIT PURCHASE

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall no more frequently than monthly, nor less frequently than annually, pay to Customer \$0.\_\_\_\_\_ per metered AC kilowatt-hour of net renewable energy production from the Customer System installed under this Agreement, provided that said System is operational

within 180 days after execution of this Agreement. Payment shall not be for less than \$25.00 unless a full twelve (12) months has elapsed since the last such payment. All such payments shall be made by Company within thirty (30) days of the end of each calendar month in which energy is generated by the Customer System and received by Company. The Customer System's first payment shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System, and a successful Customer System inspection pursuant to Section 3 above.

#### **6. RIGHTS FOR CREDITS**

Company shall have the right to purchase Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

#### **7. METER READING**

No more often than once per month nor less often than once per year during the term of this Agreement, Company shall read the Customer System renewable energy production meter for purpose of determining the payment amount per Section 5 above. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

#### **8. WARRANTY**

COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.

#### **9. LIMITATION OF LIABILITY**

COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.

#### **10. TERMINATION**

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within thirty (30) days following written notice thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

## 11. MISCELLANEOUS

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1 Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by the Customer without the prior written consent of Company.
- 11.2 Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3 Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4 Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5 Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6 Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7 Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.
- 11.8 Customer Sale of Residence. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be

disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.

- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:** **UNS Electric, Inc.**  
PO Box 3099  
Kingman, Arizona 86402  
Fax: (928) 681-8915  
Attn: Energy Services Department

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Annual Energy Reserved: \_\_\_\_\_ KWh**

**Estimated Annual Payment \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**

**Application Process**  
**ATTACHMENT A**  
**Off-Grid Small Wind System Qualifications**

All off-grid small wind Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. Eligible small wind systems must be certified and nameplate rated by the CEC<sup>1</sup>. See [www.consumerenergycenter.org/erprebate/equipment.html](http://www.consumerenergycenter.org/erprebate/equipment.html) for a list of certified generators. For grid tied or off-grid wind generators where an inverter is used, the CEC listed nameplate rating of the wind generator will be multiplied by the CEC approved weighted efficiency percentage listed for the inverter in the "List of Eligible Inverters" at [www.consumerenergycenter.org/cgi-bin/eligible\\_inverters.cgi](http://www.consumerenergycenter.org/cgi-bin/eligible_inverters.cgi) to calculate the wind turbine nameplate rating for use in determining the UFI payment.
2. Off-grid systems of capacity less than 10 kWac will not be metered. Compliance reporting production will be based on an annual 20% capacity factor.
3. The tower used in the installation must be designed by an Arizona registered engineer and must be suitable for use with the wind generator. Tower installation must be designed and supervised by individuals familiar with local geotechnical conditions.
4. To receive a UFI, the wind generator and system must be covered by a manufacturer's warranty of at least ten years. Otherwise the system will qualify for a PBI. In all cases the wind system will have a material and labor warrantee of at least five years.
5. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code, including Article 690 and all grounding, conductor, raceway, overcurrent protection, disconnect and labeling requirements.
6. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code in effect in the jurisdiction where the installation is being completed (NEC).
7. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
8. For Residential Customer Systems, Company will provide a meter and meter socket that will be installed in a readily accessible outdoor location by the Customer between the

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<sup>1</sup> UNS ELECTRIC recommends review of the SWCC standards for rating small wind generators once they become available for purposes of supplanting the CEC requirement in this Technology Criterion.



Customer System and the connection to the overcurrent device in the Customer's electric service panel. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel.

9. Energy storage devices are not allowed as part of the Customer System unless the energy storage device is a separate component and Company can locate the SunShare Meter at the Customer System's output.
10. Installation must have been made after January 1, 1997.
11. All Customer System installations must be completed in a professional, workmanlike and safe manner.

**UNS Electric, Inc.**  
**GreenWatts<sup>™</sup> SunShare Program**  
**Performance Based Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**On-Grid Non-Residential Solar**  
**20 kW or less**

This GreenWatts<sup>™</sup> SunShare Performance Based Incentive (PBI) Program Renewable Energy Credit Purchase Agreement (the "Agreement") is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer"). Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of renewable electricity generation facilities and the consumption of renewable electricity within its service territory, while concurrently reducing the cost of renewable electric generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install renewable generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts<sup>™</sup>, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, \_\_\_\_\_, \_\_\_\_\_, Arizona (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM:**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:

## 1.1 Renewable Energy System

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy on-grid residential solar technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payments. Customer environmental credits and Company payments shall be based on the actual metered renewable energy production as explained in Section 5 below. This represents a Performance Based Incentive payment method.

## 2. SYSTEM INSTALLATION

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A, including, without limitation, a proper interconnection with Company's existing power grid. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## 3. SYSTEM INSPECTION

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## 4. SYSTEM ELECTRICAL OUTPUT

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and, upon receipt of payment by the Company for the Performance Based Incentive based on actual energy generated from the installation and use of the Customer System, assigns by operation of this Agreement all resultant associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff (REST) program (the "Renewable Energy Credits"). Company will thereafter return any and all such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until the last day of the month of \_\_\_\_\_ in 20\_\_\_\_ and shall survive any termination of this Agreement.

## 5. RENEWABLE ENERGY CREDIT PURCHASE

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall no more frequently than monthly, nor less frequently than annually, pay to

Customer \$0.\_\_\_\_\_ per metered AC kilowatt-hour of net renewable energy production from the Customer System installed under this Agreement, provided that said System is operational within 180 days after execution of this Agreement. Payment shall not be for less than \$25.00 unless a full twelve (12) months has elapsed since the last such payment. All such payments shall be made by Company within thirty (30) days of the end of each calendar month in which energy is generated by the Customer System and received by Company. The Customer System's first payment shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System, and a successful Customer System inspection pursuant to Section 3 above.

#### **6. RIGHTS FOR CREDITS**

Company shall have the right to purchase Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

#### **7. METER READING**

No more often than once per month nor less often than once per year during the term of this Agreement, Company shall read the Customer System renewable energy production meter for purpose of determining the payment amount per Section 5 above. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

#### **8. WARRANTY**

**COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.**

#### **9. LIMITATION OF LIABILITY**

**COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.**

#### **10. TERMINATION**

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within thirty (30) days following written notice thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

## 11. MISCELLANEOUS

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1 Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by the Customer without the prior written consent of Company.
- 11.2 Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3 Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4 Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5 Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6 Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7 Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.
- 11.8 Customer Sale of Facility. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall

expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.

- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:** **UNS Electric, Inc.**  
PO Box 3099  
Kingman, Arizona 86402  
Fax: (928) 681-8915  
Attn: Energy Services Department

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Annual Energy Reserved: \_\_\_\_\_ KWh**

**Estimated Annual Payment \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**

**Application Process**  
**ATTACHMENT A**  
**On-Grid Non-Residential Solar 20 kW or less System Qualifications**

All on-grid non-residential solar 20 kW or less Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. All systems shall be installed with a horizontal tilt angle between 10 degrees and 60 degrees, and an azimuth angle of +/- 100 degrees of due south. Installation configurations for some systems receiving a UFI will not be eligible for the full RECPP incentive. The reduction will be determined by the UNS ELECTRIC developed de-rating chart, Attachment B of this document, and as discussed further in this report under the section titled Conforming Project Incentives.
2. A system must include a dedicated performance meter (on grid tied systems, supplied by UNS ELECTRIC) to allow for monitoring of the amount of electricity produced.
3. Qualifying systems using Building Integrated Photovoltaic (BIPV) modules of total array capacity of 5 kWDC or less shall receive 90% of the UFI incentive value for PV systems listed in Attachment A. Systems using BIPV module of total array capacity of greater than 5 kWDC shall only receive a PBI.
4. Photovoltaic modules must be covered by a manufacturer's warranty of at least 20 years.
5. Inverters must be covered by a manufacturer's warranty of at least ten years to receive a UFI and at least five years to receive a PBI.
6. The minimum PV array size shall be no less than 1,200 Wdc.
7. All photovoltaic modules must be certified by a nationally recognized testing laboratory as meeting the requirements of UL Standard 1703.
8. All other electrical components must be UL listed.
9. The inverter must be certified as meeting the requirements of IEEE-1547 - Recommended Practice for Utility Interface of Photovoltaic Systems and it must be UL 1741 certified.
10. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code, including Article 690 and all grounding, conductor, raceway, overcurrent protection, disconnect and labeling requirements.
11. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official



having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code in effect in the jurisdiction where the installation is being completed (NEC), including, without limitation, Sections 200-6, 210-6, 230-70, 240-3, 250-26, 250-50, 250-122, all of Article 690 pertaining to Solar Photovoltaic Systems, thereof, all as amended and superseded.

12. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
13. The Customer System installation must meet the UNS Electric Service Requirements as follows:

"AN AC DISCONNECT MEANS SHALL BE PROVIDED IN AN AREA ACCESSIBLE AT ALL TIMES TO THE COMPANY ON ALL UNGROUNDED AC CONDUCTORS AND SHALL CONSIST OF A LOCKABLE GANG OPERATED DISCONNECT CLEARLY INDICATING OPEN OR CLOSED. THE SWITCH SHALL BE VISUALLY INSPECTED TO DETERMINE THAT IT IS OPEN. THE SWITCH SHALL BE CLEARLY LABELED "DG SERVICE DISCONNECT."

14. For Customer Systems, Company will provide a meter and meter socket that will be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel.
15. Energy storage devices are not allowed as part of the Customer System unless the energy storage device is a separate component and Company can locate the SunShare Meter at the Customer System's output.
16. Installation must have been made after January 1, 1997.
17. All Customer System installations must be completed in a professional, workmanlike and safe manner.

**UNS Electric, Inc.**  
**GreenWatts<sup>TM</sup> SunShare Program**  
**Performance Based Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**On-Grid Small Wind**

This GreenWatts<sup>TM</sup> SunShare Performance Based Incentive (PBI) Program Renewable Energy Credit Purchase Agreement (the "Agreement") is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 200\_\_, by and between UNS Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer"). Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of renewable electricity generation facilities and the consumption of renewable electricity within its service territory, while concurrently reducing the cost of renewable electric generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install renewable generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts<sup>TM</sup>, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, at the address of \_\_\_\_\_, \_\_\_\_\_, Arizona (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM:**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:

## 1.1 Renewable Energy System

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy on-grid small wind generation technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payments. Customer environmental credits and Company payments shall be based on the actual metered renewable energy production as explained in Section 5 below. This represents a Performance Based Incentive payment method.

## 2. SYSTEM INSTALLATION

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A, including, without limitation, a proper interconnection with Company's existing power grid. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## 3. SYSTEM INSPECTION

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## 4. SYSTEM ELECTRICAL OUTPUT

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and, upon receipt of payment by the Company for the Performance Based Incentive based on actual energy generated from the installation and use of the Customer System, assigns by operation of this Agreement all resultant associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff (REST) program (the "Renewable Energy Credits"). Company will thereafter return any and all such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until the last day of the month of \_\_\_\_\_ in 200\_\_\_\_ and shall survive any termination of this Agreement.

## 5. RENEWABLE ENERGY CREDIT PURCHASE

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall no more frequently than monthly, nor less frequently than annually, pay to Customer \$0.\_\_\_\_\_ per metered AC kilowatt-hour of net renewable energy production from

the Customer System installed under this Agreement, provided that said System is operational within 180 days after execution of this Agreement. Payment shall not be for less than \$25.00 unless a full twelve (12) months has elapsed since the last such payment. All such payments shall be made by Company within thirty (30) days of the end of each calendar month in which energy is generated by the Customer System and received by Company. The Customer System's first payment shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System, and a successful Customer System inspection pursuant to Section 3 above.

#### **6. RIGHTS FOR CREDITS**

Company shall have the right to purchase Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

#### **7. METER READING**

No more often than once per month nor less often than once per year during the term of this Agreement, Company shall read the Customer System renewable energy production meter for purpose of determining the payment amount per Section 5 above. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

#### **8. WARRANTY**

COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.

#### **9. LIMITATION OF LIABILITY**

COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.

#### **10. TERMINATION**

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within thirty (30) days following written notice thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

## 11. MISCELLANEOUS

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1 Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by the Customer without the prior written consent of Company.
- 11.2 Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3 Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4 Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5 Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6 Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7 Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.
- 11.8 Customer Sale of Residence. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall expressly assume all of Customer's obligations hereunder in writing, and this

Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.

- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:** **UNS Electric, Inc.**  
PO Box 3099  
Kingman, Arizona 86402  
Fax: (928) 681-8915  
Attn: Energy Services Department

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 200\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Annual Energy Reserved: \_\_\_\_\_ KWh**

**Estimated Annual Payment \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**

**Application Process**  
**ATTACHMENT A**  
**On-Grid Small Wind System Qualifications**

All on-grid small wind generating Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. Eligible small wind systems must be certified and nameplate rated by the CEC<sup>1</sup>. See [www.consumerenergycenter.org/erprebate/equipment.html](http://www.consumerenergycenter.org/erprebate/equipment.html) for a list of certified generators. For grid tied or off-grid wind generators where an inverter is used, the CEC listed nameplate rating of the wind generator will be multiplied by the CEC approved weighted efficiency percentage listed for the inverter in the "List of Eligible Inverters" at [www.consumerenergycenter.org/cgi-bin/eligible\\_inverters.cgi](http://www.consumerenergycenter.org/cgi-bin/eligible_inverters.cgi) to calculate the wind turbine nameplate rating for use in determining the UFI payment.
2. Grid connected inverters used as part of the system shall carry a UL listing certifying full compliance with Underwriter's Laboratory ("UL")-1741.
3. The tower used in the installation must be designed by an Arizona registered engineer and must be suitable for use with the wind generator. Tower installation must be designed and supervised by individuals familiar with local geotechnical conditions.
4. To receive a UFI, the wind generator and system must be covered by a manufacturer's warranty of at least ten years. Otherwise the system will qualify for a PBI. In all cases the wind system will have a material and labor warrantee of at least five years.
5. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code, including Article 690 and all grounding, conductor, raceway, overcurrent protection, disconnect and labeling requirements.
6. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code in effect in the jurisdiction where the installation is being completed (NEC).
7. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
8. The Customer System installation must meet the UNS Electric Service Requirements as follows:

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<sup>1</sup> UNS ELECTRIC recommends review of the SWCC standards for rating small wind generators once they become available for purposes of supplanting the CEC requirement in this Technology Criterion.



"AN AC DISCONNECT MEANS SHALL BE PROVIDED IN AN AREA ACCESSIBLE AT ALL TIMES TO THE COMPANY ON ALL UNGROUNDED AC CONDUCTORS AND SHALL CONSIST OF A LOCKABLE GANG OPERATED DISCONNECT CLEARLY INDICATING OPEN OR CLOSED. THE SWITCH SHALL BE VISUALLY INSPECTED TO DETERMINE THAT IT IS OPEN. THE SWITCH SHALL BE CLEARLY LABELED "DG SERVICE DISCONNECT."

9. For Residential Customer Systems, Company will provide a meter and meter socket that will be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel.
10. Energy storage devices are not allowed as part of the Customer System unless the energy storage device is a separate component and Company can locate the SunShare Meter at the Customer System's output.
11. Installation must have been made after January 1, 1997.
12. The Customer must be connected to the Company's electric grid.
13. All Customer System installations must be completed in a professional, workmanlike and safe manner.

**UNS Electric, Inc.**  
**GreenWatts<sup>TM</sup> SunShare Program**  
**Performance Based Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**On-Grid Residential Solar**

This GreenWatts<sup>TM</sup> SunShare Performance Based Incentive (PBI) Program Renewable Energy Credit Purchase Agreement (the "Agreement") is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer"). Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of renewable electricity generation facilities and the consumption of renewable electricity within its service territory, while concurrently reducing the cost of renewable electric generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install renewable generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts<sup>TM</sup>, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, \_\_\_\_\_, \_\_\_\_\_, Arizona (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM:**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:

## 1.1 Renewable Energy System

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy on-grid residential solar technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payments. Customer environmental credits and Company payments shall be based on the actual metered renewable energy production as explained in Section 5 below. This represents a Performance Based Incentive payment method.

## 2. SYSTEM INSTALLATION

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A, including, without limitation, a proper interconnection with Company's existing power grid. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## 3. SYSTEM INSPECTION

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## 4. SYSTEM ELECTRICAL OUTPUT

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and, upon receipt of payment by the Company for the Performance Based Incentive based on actual energy generated from the installation and use of the Customer System, assigns by operation of this Agreement all resultant associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff (REST) program (the "Renewable Energy Credits"). Company will thereafter return any and all such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until the last day of the month of \_\_\_\_\_ in 20\_\_\_\_ and shall survive any termination of this Agreement.

## 5. RENEWABLE ENERGY CREDIT PURCHASE

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall no more frequently than monthly, nor less frequently than annually, pay to Customer \$0.\_\_\_\_\_ per metered AC kilowatt-hour of net renewable energy production from

the Customer System installed under this Agreement, provided that said System is operational within 180 days after execution of this Agreement. Payment shall not be for less than \$25.00 unless a full twelve (12) months has elapsed since the last such payment. All such payments shall be made by Company within thirty (30) days of the end of each calendar month in which energy is generated by the Customer System and received by Company. The Customer System's first payment shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System, and a successful Customer System inspection pursuant to Section 3 above.

#### **6. RIGHTS FOR CREDITS**

Company shall have the right to purchase Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

#### **7. METER READING**

No more often than once per month nor less often than once per year during the term of this Agreement, Company shall read the Customer System renewable energy production meter for purpose of determining the payment amount per Section 5 above. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

#### **8. WARRANTY**

**COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.**

#### **9. LIMITATION OF LIABILITY**

**COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.**

#### **10. TERMINATION**

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within thirty (30) days following written notice thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

## 11. MISCELLANEOUS

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1 Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by the Customer without the prior written consent of Company.
- 11.2 Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3 Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4 Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5 Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6 Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7 Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.
- 11.8 Customer Sale of Residence. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall expressly assume all of Customer's obligations hereunder in writing, and this

Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.

- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:** **UNS Electric, Inc.**  
PO Box 3099  
Kingman, Arizona 86402  
Fax: (928) 681-8915  
Attn: Energy Services Department

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Annual Energy Reserved: \_\_\_\_\_ KWh**

**Estimated Annual Payment \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**

**Application Process**  
**ATTACHMENT A**  
**On-Grid Residential Solar System Qualifications**

All on-grid residential solar Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. All systems shall be installed with a horizontal tilt angle between 10 degrees and 60 degrees, and an azimuth angle of +/- 100 degrees of due south. Installation configurations for some systems receiving a UFI will not be eligible for the full RECPP incentive. The reduction will be determined by the UNS ELECTRIC developed de-rating chart, Attachment B of this document, and as discussed further in this report under the section titled Conforming Project Incentives.
2. A system must include a dedicated performance meter (on grid tied systems, supplied by UNS ELECTRIC) to allow for monitoring of the amount of electricity produced.
3. Qualifying systems using Building Integrated Photovoltaic (BIPV) modules of total array capacity of 5 kWDC or less shall receive 90% of the UFI incentive value for PV systems listed in Attachment A. Systems using BIPV module of total array capacity of greater than 5 kWDC shall only receive a PBI.
4. Photovoltaic modules must be covered by a manufacturer's warranty of at least 20 years.
5. Inverters must be covered by a manufacturer's warranty of at least ten years to receive a UFI and at least five years to receive a PBI.
6. The minimum PV array size shall be no less than 1,200 Wdc.
7. All photovoltaic modules must be certified by a nationally recognized testing laboratory as meeting the requirements of UL Standard 1703.
8. All other electrical components must be UL listed.
9. The inverter must be certified as meeting the requirements of IEEE-1547 - Recommended Practice for Utility Interface of Photovoltaic Systems and it must be UL 1741 certified.
10. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code, including Article 690 and all grounding, conductor, raceway, overcurrent protection, disconnect and labeling requirements.
11. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official



having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code in effect in the jurisdiction where the installation is being completed (NEC), including, without limitation, Sections 200-6, 210-6, 230-70, 240-3, 250-26, 250-50, 250-122, all of Article 690 pertaining to Solar Photovoltaic Systems, thereof, all as amended and superseded.

12. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
13. The Customer System installation must meet the UNS Electric Service Requirements as follows:

"AN AC DISCONNECT MEANS SHALL BE PROVIDED IN AN AREA ACCESSIBLE AT ALL TIMES TO THE COMPANY ON ALL UNGROUNDED AC CONDUCTORS AND SHALL CONSIST OF A LOCKABLE GANG OPERATED DISCONNECT CLEARLY INDICATING OPEN OR CLOSED. THE SWITCH SHALL BE VISUALLY INSPECTED TO DETERMINE THAT IT IS OPEN. THE SWITCH SHALL BE CLEARLY LABELED "DG SERVICE DISCONNECT."

14. For Residential Customer Systems, Company will provide a meter and meter socket that will be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel.
15. Energy storage devices are not allowed as part of the Customer System unless the energy storage device is a separate component and Company can locate the SunShare Meter at the Customer System's output.
16. Installation must have been made after January 1, 1997.
17. All Customer System installations must be completed in a professional, workmanlike and safe manner.

**UNS Electric, Inc.**  
**GreenWatts<sup>™</sup> SunShare Program**  
**Performance Based Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**Small Hydro**

This GreenWatts<sup>™</sup> SunShare Performance Based Incentive (PBI) Program Renewable Energy Credit Purchase Agreement (the "Agreement") is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer"). Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of renewable electricity generation facilities and the consumption of renewable electricity within its service territory, while concurrently reducing the cost of renewable electric generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install renewable generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts<sup>™</sup>, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, at the address of \_\_\_\_\_, \_\_\_\_\_, Arizona (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM:**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:

## 1.1 Renewable Energy System

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy small hydro technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payments. Customer environmental credits and Company payments shall be based on the actual metered renewable energy production as explained in Section 5 below. This represents a Performance Based Incentive payment method.

## 2. SYSTEM INSTALLATION

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A, including, without limitation, a proper interconnection with Company's existing power grid. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## 3. SYSTEM INSPECTION

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## 4. SYSTEM ELECTRICAL OUTPUT

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and, upon receipt of payment by the Company for the Performance Based Incentive based on actual energy generated from the installation and use of the Customer System, assigns by operation of this Agreement all resultant associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff (REST) program (the "Renewable Energy Credits"). Company will thereafter return any and all value of such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until the last day of the month of \_\_\_\_\_ in 20\_\_\_\_ and shall survive any termination of this Agreement.

## 5. RENEWABLE ENERGY CREDIT PURCHASE

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall no more frequently than monthly, nor less frequently than annually, pay to Customer \$0.\_\_\_\_ per metered AC kilowatt-hour of net renewable energy production from the

Customer System installed under this Agreement, provided that said System is operational within 180 days after execution of this Agreement. Payment shall not be for less than \$25.00 unless a full twelve (12) months has elapsed since the last such payment. All such payments shall be made by Company within thirty (30) days of the end of each calendar month in which energy is generated by the Customer System and received by Company. The Customer System's first payment shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System, and a successful Customer System inspection pursuant to Section 3 above.

#### **6. RIGHTS FOR CREDITS**

Company shall have the right to purchase Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

#### **7. METER READING**

No more often than once per month nor less often than once per year during the term of this Agreement, Company shall read the Customer System renewable energy production meter for purpose of determining the payment amount per Section 5 above. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

#### **8. WARRANTY**

COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.

#### **9. LIMITATION OF LIABILITY**

COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.

#### **10. TERMINATION**

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within thirty (30) days following written notice thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

## 11. MISCELLANEOUS

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1 Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by the Customer without the prior written consent of Company.
- 11.2 Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3 Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4 Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5 Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6 Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7 Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.
- 11.8 Customer Sale of Residence. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall expressly assume all of Customer's obligations hereunder in writing, and this

Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.

- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:** **UNS Electric, Inc.**  
PO Box 3099  
Kingman, Arizona 86402  
Fax: (928) 681-8915  
Attn: Energy Services Department

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

Estimated Annual Energy Reserved: \_\_\_\_\_ KWh

Estimated Annual Payment \$ \_\_\_\_\_

Date Reserved: \_\_\_\_\_

**Application Process**  
**ATTACHMENT A**  
**Small Hydro System Qualifications**

All small hydro Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. Hydro system installations are required to comply with all Arizona regulations; provide a qualifying generation inspection identification number; and keep all applicable generator permits in good standing.
2. Pre-operational/or pre-commissioning energy savings and design output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a qualified registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
3. The system will have a material and labor warranty of at least five years.
4. The system must meet Arizona DEQ environmental standards.
5. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code, including Article 690 and all grounding, conductor, raceway, overcurrent protection, disconnect and labeling requirements.
6. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code in effect in the jurisdiction where the installation is being completed (NEC).
7. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
8. The Customer System installation must meet the UNS Electric Service Requirements as follows:

"AN AC DISCONNECT MEANS SHALL BE PROVIDED IN AN AREA ACCESSIBLE AT ALL TIMES TO THE COMPANY ON ALL UNGROUNDED AC CONDUCTORS AND SHALL CONSIST OF A LOCKABLE GANG OPERATED DISCONNECT CLEARLY INDICATING OPEN OR CLOSED. THE SWITCH SHALL BE VISUALLY INSPECTED TO DETERMINE THAT IT IS OPEN. THE



SWITCH SHALL BE CLEARLY LABELED "DG SERVICE DISCONNECT."

9. For Residential Customer Systems, Company will provide a meter and meter socket that will be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel.
10. Energy storage devices are not allowed as part of the Customer System unless the energy storage device is a separate component and Company can locate the SunShare Meter at the Customer System's output.
11. Installation must have been made after January 1, 1997.
12. The Customer must be connected to the Company's electric grid.
13. All Customer System installations must be completed in a professional, workmanlike and safe manner.

**UNS Electric, Inc.**  
**GreenWatts<sup>TM</sup> SunShare Program**  
**Performance Based Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**Non-Residential Solar Water - Space Heating**

This GreenWatts<sup>TM</sup> SunShare Performance Based Incentive (PBI) Program Renewable Energy Credit Purchase Agreement (the "Agreement") is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer"). Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of renewable thermal facilities and the consumption of renewable electricity within its service territory, while concurrently reducing the cost of renewable systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install renewable generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts<sup>TM</sup>, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, \_\_\_\_\_, \_\_\_\_\_, Arizona (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM:**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:

## 1.1 Renewable Energy System

1.1.1 System. Customer shall purchase a renewable energy system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy solar non-residential solar water heating – space heating generation technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payments. Customer environmental credits and Company payments shall be based on the actual metered renewable energy production as explained in Section 5 below. This represents a Performance Based Incentive payment method.

## 2. SYSTEM INSTALLATION

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## 3. SYSTEM INSPECTION

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## 4. SYSTEM ELECTRICAL OUTPUT

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and, upon receipt of payment by the Company for the Performance Based Incentive based on actual energy generated from the installation and use of the Customer System, assigns by operation of this Agreement all resultant associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff (REST) program (the "Renewable Energy Credits"). Company will thereafter return any and all value of such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until the last day of the month of \_\_\_\_\_ in 20\_\_\_\_ and shall survive any termination of this Agreement.

## 5. RENEWABLE ENERGY CREDIT PURCHASE

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall no more frequently than monthly, nor less frequently than annually, pay to Customer \$0.\_\_\_\_ per metered AC kilowatt-hour of net renewable energy production from the

Customer System installed under this Agreement, provided that said System is operational within 180 days after execution of this Agreement. Payment shall not be for less than \$25.00 unless a full twelve (12) months has elapsed since the last such payment. All such payments shall be made by Company within thirty (30) days of the end of each calendar month in which energy is generated by the Customer System and received by Company. The Customer System's first payment shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System, and a successful Customer System inspection pursuant to Section 3 above. Energy for payment shall be calculated at the conversion rate of 3,415 Btu per kWh as recorded on the dedicated performance customer supplied meter to allow for monitoring of the amount of useful heat produced.

#### **6. RIGHTS FOR CREDITS**

Company shall have the right to purchase Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

#### **7. METER READING**

No more often than once per month nor less often than once per year during the term of this Agreement, Company shall read the Customer System renewable energy production meter for purpose of determining the payment amount per Section 5 above. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

#### **8. WARRANTY**

**COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.**

#### **9. LIMITATION OF LIABILITY**

**COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.**

#### **10. TERMINATION**

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within thirty (30) days following written notice

thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

## 11. MISCELLANEOUS

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1 Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by the Customer without the prior written consent of Company.
- 11.2 Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3 Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4 Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5 Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6 Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7 Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.
- 11.8 Customer Sale of Facility. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-

in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.

- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:**

**UNS Electric, Inc.**

PO Box 3099

Kingman, Arizona 86402

Fax: (928) 681-8915

Attn: Renewable Energy & Energy Efficiency Group

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Annual Energy Reserved: \_\_\_\_\_ KWh**

**Estimated Annual Payment \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**

**Application Process**  
**ATTACHMENT A**  
**Non-Residential Solar Water Heating - Space Heating System Qualifications**

All non-residential solar water heating - space heating Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric " or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. Solar collector panels used will have a SRCC OG-100 certification or laboratory documentation showing the panel energy output under controlled and replicable test conditions.
2. If annual energy production is expected to exceed 10,000 kWh or equivalent, the system must include a dedicated performance customer supplied meter to allow for monitoring of the amount of useful heat produced. Otherwise, compliance reporting production will be based on the design energy savings submitted at time of application.
3. Energy savings and designed output for the system will be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer. The engineering report shall provide a description of the system and major components, design criteria and performance expectations, applicable standards and/or codes, and a brief history of components in similar applications.
4. The solar collector, heat exchangers and storage elements shall have an equipment warranty of at least 10 years to qualify for a UFI and at least five years to qualify for a PBI.
5. The system will in all cases have a material and full labor warranty of at least five years.
6. The horizontal tilt angle of the collector panels should be between 20 and 60 degrees (30 and 60 degrees for space heating applications) and an azimuth angle +/- 45 degrees of south.
7. All systems should be installed such that the energy collection system is substantially unshaded and should have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.
8. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Plumbing Code.
9. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.



10. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel.
11. Energy storage devices are not allowed as part of the Customer System unless the energy storage device is a separate component and Company can locate the SunShare Meter at the Customer System's output.
12. Installation must have been made after January 1, 1997.
13. All Customer System installations must be completed in a professional, workmanlike and safe manner.

**UNS Electric, Inc.**  
**GreenWatts™ SunShare Program**  
**Performance Based Incentive**  
**Renewable Energy Credit Purchase Agreement**  
**Residential Solar Water - Space Heating**

This GreenWatts™ SunShare Performance Based Incentive (PBI) Program Renewable Energy Credit Purchase Agreement (the "Agreement") is hereby made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between UNS Electric, Inc., an Arizona corporation ("Company"), and \_\_\_\_\_, ("Customer"). Company and Customer may be referred to individually herein as a "Party" or collectively as the "Parties."

**RECITALS**

A. Company desires to increase the number of renewable electricity generation facilities and the consumption of renewable electricity within its service territory, while concurrently reducing the cost of renewable electric generation systems for its customers. In support of these objectives and to further Company's continuing commitment to develop and encourage the use of renewable energy resources, Company has implemented a program to provide financial incentives to its customers to install renewable generating equipment (the "SunShare Program"). The SunShare Program was developed under GreenWatts™, the Company's existing renewable energy program; and

B. Company desires for Customer to participate in the SunShare Program and Customer desires to so participate under the terms and conditions contained in this Agreement, \_\_\_\_\_, \_\_\_\_\_, Arizona (the "Premises").

NOW, THEREFORE, in consideration of these premises and of the mutual promises herein contained, Company and Customer hereby agree as follows:

**AGREEMENT**

**1. PROGRAM:**

Customer shall elect to participate in the SunShare Program by entering into this Agreement subject to the following conditions:

## 1.1 Renewable Energy System

1.1.1 System. Customer shall purchase a renewable energy generating system from any third party of Customer's choice ("Customer System"). To qualify under the SunShare Program, any such Customer System must comply with all renewable energy residential solar water - space heating generation technology specific requirements set forth in Attachment A "System Qualifications", which is attached hereto and incorporated herein.

1.1.2 Basis of Payments. Customer environmental credits and Company payments shall be based on the actual metered renewable energy production as explained in Section 5 below. This represents a Performance Based Incentive payment method.

## 2. SYSTEM INSTALLATION

To qualify for participation in the SunShare Program, all Customer Systems shall be installed by or on behalf of Customer in accordance with the requirements set forth in Attachment A, including, without limitation, a proper interconnection with Company's existing power grid. Customer shall be solely responsible for the installation of the Customer System, including all costs and expenses associated therewith.

## 3. SYSTEM INSPECTION

Following installation of Customer's System, Company shall inspect the Customer System for compliance with the applicable requirements set forth in Attachment A. If the Customer System or installation is found to be not in compliance for any reason, Company will notify Customer of the deficiencies causing the noncompliance. Company will have no further obligations under this Agreement until all such deficiencies are remedied by Customer to Company's reasonable satisfaction.

## 4. SYSTEM ELECTRICAL OUTPUT

Customer hereby assigns to Company all of its rights to all electrical output of the Customer System and, upon receipt of payment by the Company for the Performance Based Incentive based on actual energy generated from the installation and use of the Customer System, assigns by operation of this Agreement all resultant associated environmental credits, specifically including those created under the Arizona Corporation Commission's Renewable Energy Standard and Tariff (REST) program (the "Renewable Energy Credits"). Company will thereafter return any and all such electric output to the Customer at no cost to Customer. Company's right to Customer's power output and credits assigned hereunder shall continue until the last day of the month of \_\_\_\_\_ in 20\_\_\_\_ and shall survive any termination of this Agreement.

## 5. RENEWABLE ENERGY CREDIT PURCHASE

Subject to the Customer System passing the Company inspection set forth in Section 3 above and to Customer's compliance with the remaining terms and conditions of this Agreement, Company shall no more frequently than monthly, nor less frequently than annually, pay to

Customer \$0. \_\_\_\_\_ per metered AC kilowatt-hour of net renewable energy production from the Customer System installed under this Agreement, provided that said System is operational within 180 days after execution of this Agreement. Payment shall not be for less than \$25.00 unless a full twelve (12) months has elapsed since the last such payment. All such payments shall be made by Company within thirty (30) days of the end of each calendar month in which energy is generated by the Customer System and received by Company. The Customer System's first payment shall be determined by Company following Company's receipt of a copy of the City or County building permit associated with the installation of the Customer System, and a successful Customer System inspection pursuant to Section 3 above. Energy for payment shall be calculated at the conversion rate of 3,415 Btu per kWh as recorded on the dedicated performance customer supplied meter to allow for monitoring of the amount of useful heat produced.

#### **6. RIGHTS FOR CREDITS**

Company shall have the right to purchase Renewable Energy Credits from the Customer System so long as the Customer System is installed on the Customer's premises until the end of the month and year noted in Section 4. Customer shall not offer to sell or trade Renewable Energy Credits from the Customer System to any other party until the expiration of this Renewable Energy Credit Purchase Agreement as set forth in Section 4 above.

#### **7. METER READING**

No more often than once per month nor less often than once per year during the term of this Agreement, Company shall read the Customer System renewable energy production meter for purpose of determining the payment amount per Section 5 above. Customer shall provide Company with reasonable access to its Customer System to conduct any such readings.

#### **8. WARRANTY**

**COMPANY MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND HEREUNDER, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PERFORMANCE OF ANY SERVICES OR PROVISION OF ANY GOODS HEREUNDER.**

#### **9. LIMITATION OF LIABILITY**

**COMPANY'S ENTIRE LIABILITY ARISING OUT OF ITS PERFORMANCE UNDER THIS AGREEMENT SHALL BE LIMITED TO CLAIMS DIRECTLY ATTRIBUTABLE TO COMPANY'S GROSS NEGLIGENCE OR WILFUL MISCONDUCT. IN NO EVENT SHALL COMPANY, ITS EMPLOYEES OR AGENTS BE LIABLE TO CUSTOMER FOR LOSS OF PROFITS OR ANY OTHER SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGE, HOWEVER CAUSED, RESULTING FROM COMPANY'S PERFORMANCE HEREUNDER.**

## 10. TERMINATION

If either Party shall at any time commit any material breach of any covenant or warranty under this Agreement and shall fail to cure the same within thirty (30) days following written notice thereof, the non-breaching Party may terminate this Agreement, in whole or in part. This Agreement may also be terminated at any time by mutual written agreement of the Parties.

## 11. MISCELLANEOUS

Modification, Waiver and Severability. This Agreement may not be modified or supplemented except by written instrument signed by the Parties. No waiver of any default or breach hereof shall be deemed a waiver of any other default or breach thereof. If any part of this Agreement is declared void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.

- 11.1 Assignment. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by the Customer without the prior written consent of Company.
- 11.2 Governing Law and Venue. This Agreement shall be governed by the laws of the State of Arizona, without regard to the choice of law provisions thereof. Venue for any dispute arising hereunder shall be any court of competent jurisdiction located in Pima County, Arizona.
- 11.3 Entire Agreement. This Agreement is the final integration of the agreement between the Parties with respect to the matters covered by it and supersedes any prior understanding or agreements, oral or written, with respect thereto.
- 11.4 Counterparts. This Agreement may be executed in any number of counterparts, all of which taken together shall constitute one and the same Agreement.
- 11.5 Titles and Captions. Titles or captions contained in this Agreement are inserted for convenience and for reference only and in no way define, limit, extend, or describe the scope of this Agreement or the intent of any provision hereof.
- 11.6 Expenses and Attorney's Fees. In the event of a breach or threatened breach of any term or provision of this Agreement, the non-breaching party shall be entitled to all of its remedies available at law or in equity, unless otherwise limited in this Agreement, and in addition shall be entitled to be reimbursed for all of its reasonable costs and expenses in enforcing this Agreement (if successful), including, but not limited to, reasonable attorney's fees. This section shall survive termination or expiration of this Agreement for any reason.
- 11.7 Force Majeure. Neither Party shall be liable to the other for failure to perform its obligations hereunder to the extent such failure results from causes beyond its reasonable control, including strikes, climatic conditions, acts of God, governmental laws, regulations, orders or requirements, interruptions of power or unavailability of equipment or supplies.

- 11.8 Customer Sale of Residence. In the event Customer sells or otherwise transfers the Premises where the Customer installed the Customer System, Customer shall inform Customer's successor-in-interest of this Agreement, and if said successor-in-interest wishes to assume the Agreement, Customer shall be responsible for assigning the Agreement. In such instance, the successor-in-interest shall expressly assume all of Customer's obligations hereunder in writing, and this Agreement shall not be affected, nor shall Company's rights hereunder be disturbed in any way, including, without limitation, Company's continued right to all power output and credits assigned pursuant to Section 4 hereunder. Should Customer's successor-in-interest not wish to assume this Agreement, Customer shall be responsible for informing Company in writing of the transfer and such non-assumption.
- 11.9 Notices. All notices under this Agreement shall be in writing and shall be given to the Parties thereto by personal service (including receipted confirmed facsimile), or by certified or registered mail, return receipt requested, or by recognized overnight courier service, to the Parties at the Addresses set forth below. All notices shall be deemed given upon the actual receipt thereof.

**Company:** **UNS Electric, Inc.**  
PO Box 3099  
Kingman, Arizona 86402  
Fax: (928) 681-8915  
Attn: Energy Services Department

***[signatures on following page]***

IN WITNESS WHEREOF, the Parties have caused this Agreement to be  
executed as of \_\_\_\_\_, 20\_\_\_\_.

**UNS ELECTRIC, INC.**

By: \_\_\_\_\_

Title: \_\_\_\_\_

**CUSTOMER**

By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Address:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

**Estimated Annual Energy Reserved: \_\_\_\_\_ KWh**

**Estimated Annual Payment \$ \_\_\_\_\_**

**Date Reserved: \_\_\_\_\_**

**Application Process**  
**ATTACHMENT A**  
**Residential Solar Water Heating and Space Heating System Qualifications**

All residential solar water heating and space heating system Customer Systems must meet the following system and installation requirements to qualify for UNS Electric, Inc., ("UNS Electric" or the "Company") GreenWatts™ SunShare Renewable Energy Credit Purchase Program. Capitalized terms not defined herein shall have the meanings ascribed to them in the GreenWatts™ SunShare Program Renewable Energy Credit Purchase Program Agreement.

1. Domestic Solar Water Heating systems will be rated by the SRCC and meet the OG-300 system standard. Systems that include OG-100 collectors, but are not certified under OG-300, will need to be verified by submitting either a testing certification for a substantially similar system prepared by a publicly funded laboratory or by submitting an engineering report stamped by a registered professional engineer detailing annual energy savings. Solar Space Heating systems will utilize OG-100 collectors.
2. Domestic Water Heating systems shall be selected and sized according to the geographic location and hot water needs of the specific application. Reservation requests will include a manufacturer's verification disclosing that the system size and collector type proposed is appropriate for the specific application, including certification that collector stagnation temperature shall never exceed 300 degrees Fahrenheit under any possible conditions at the location of the installation. The manufacturer's verification may be presented as a manufacturer's product specification sheet and will be included in the reservation request. Compliance reporting production will be based on the design energy savings submitted at time of application.
3. Solar Space Heating systems will be sized in conformance with the Solar Space Heating Incentive Calculation Procedure (Attachment E.) Compliance reporting production will be based on the design energy savings submitted at time of application.
4. Active, open-loop systems are not eligible for UCPP incentives except for active, open-loop systems that have a proven technology or design that limits scaling and internal corrosion of system piping, and includes appropriate automatic methods for freeze protection and prevents stagnations temperatures that exceed 250 degrees F. under all conditions at the location of installation. Details disclosing conformance with this exception shall be submitted as part of the manufacturer's verification documentation.
5. Integrated Collector System (ICS) systems shall have a minimum collector piping wall thickness of 0.058 inches. Details disclosing conformance with this requirement shall be submitted as part of the manufacturer's verification documentation. ICS units shall include certification that collector stagnation temperature shall never exceed 250 degrees F. under any possible conditions at the location of the installation.
6. The 'high' limit on all Domestic Water Heating controllers shall be set no higher than 160 degrees F.



7. Active thermal storage for solar space heating systems shall use water as the storage element.
8. Contractors must provide a minimum of a five year equipment warranty as provided by the system manufacturer, including a minimum warranty period of five years for repair/replacement service to the customer.
9. The solar collector, heat exchangers and storage elements shall have an equipment warranty of at least 10 years to qualify for a UFI and at least five years to qualify for a PBI.
10. The system shall be installed with a horizontal tilt angle between 20 degrees and 60 degrees (30 and 60 degrees for space heating applications), and an azimuth angle of +/- 60 degrees of due south (+/- 45 degrees for space heating applications). It is recommended that collectors be positioned for optimum winter heating conditions at a minimum tilt angle of 45 degrees above horizontal, or as recommended by the manufacturer for the specific collector type and geographic location of installation.
11. All systems should be installed such that the energy collection system is substantially unshaded and should have substantially unobstructed exposure to direct sunlight between the hours of 9 a.m. and 3 p.m.
12. Heat exchange fluid in glycol systems should be tested, flushed and refilled with new fluid as necessary or at a minimum every five years or sooner per manufacturer's recommendations.
13. The Customer System design and installation must meet all requirements of the latest edition of the National Electrical Code, including Article 690 and all grounding, conductor, raceway, overcurrent protection, disconnect and labeling requirements.
14. The Customer System and installation must meet the requirements of all federal, state and local building codes and have been successfully inspected by the building official having jurisdiction. Accordingly, the installation must be completed in accordance with the requirements of the latest edition of National Electrical Code in effect in the jurisdiction where the installation is being completed (NEC), including, without limitation, Sections 200-6, 210-6, 230-70, 240-3, 250-26, 250-50, 250-122, all of Article 690 pertaining to Solar Photovoltaic Systems, thereof, all as amended and superseded.
15. The Customer System must meet Company and Arizona Corporation Commission interconnection requirements for self-generation equipment.
16. For Residential Customer Systems, Company will provide a meter and meter socket that will be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel. For Non-Residential Customer Systems, Company shall provide the meter only, to be installed in a Customer supplied meter socket to be installed in a readily accessible outdoor location by the Customer between the Customer System and the connection to the overcurrent device in the Customer's electric service panel.

17. Energy storage devices are not allowed as part of the Customer System unless the energy storage device is a separate component and Company can locate the SunShare Meter at the Customer System's output.
18. Installation must have been made after January 1, 1997.
19. The Customer must be connected to the Company's electric grid.
20. All Customer System installations must be completed in a professional, workmanlike and safe manner.



# EXHIBIT 6



**Customer Self-Directed Renewable Energy Option  
REST-TS2  
Renewable Energy Standard & Tariff**

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AVAILABILITY

Open to all Eligible Customers as defined at A.A.C. R14-02-1801.H.

APPLICABILITY

Any Eligible Customer that applies to the Company under this program and receives approval shall participate at its option.

PARTICIPATION PROCESS

An Eligible Customer seeking to participate shall submit to the Company a written application that describes the Distributed Renewable Energy (DRE) resources or facilities that it proposes to install and the estimated costs of the project. The Company shall have sixty (60) calendar days to evaluate and respond in writing to the Eligible Customer, either accepting or declining the project. If accepted, the Customer shall be reimbursed up to the actual dollar amounts of customer surcharge paid under the REST-TS1 Tariff in any calendar year in which DRE facilities are installed as part of the accepted project. To qualify for such funds, the Customer shall provide at least half of the funding necessary to complete the project described in the accepted application, and shall provide the Company with sufficient and reasonable written documentation of the project's costs. Customer shall submit their application prior to May 1 of a given year to apply for funding in the following calendar year.

FACILITIES INSTALLED

The maintenance and repair of the facilities installed by a Customer under this program shall be the responsibility of the Customer following completion of the project. In order to be accepted by the Company for reimbursement purposes, the project shall, at a minimum, conform to the Company's System Qualification standards on file with the Commission. (Renewable Energy Standard & Tariff – REST, Renewable Energy Credit Purchase Program – RECPP, Distributed Generation Interconnection Requirements, Company's Interconnection Manual)

PAYMENTS AND CREDITS

All funds reimbursed by the Company to the Customer for installation of approved DRE facilities shall be paid on an annual basis no later than March 30<sup>th</sup> of each calendar year. All Renewable Energy Credits derived from a project, including generation and Extra Credit Multipliers, shall become the property of the Company and shall be applied towards the Company's Annual Renewable Energy Requirement as defined in A.A.C. R14-2-1801.B.

RULES AND REGULATIONS

The standard Rules and Regulations of the Company as on file with the Arizona Corporation Commission shall apply where not inconsistent with this tariff.

RELATED SCHEDULES

- REST-TS1 - Renewable Energy Program Expense Recovery
- UNS Electric, Inc. – Rules and Regulations

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Filed By: Raymond S. Heyman  
Title: Senior Vice President  
District: Entire Electric Service Area

Tariff No.: REST-TS1  
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